ENVIRONMENTAL ASSESSMENT
LONG RANGE MUNITIONS

U.S. ARMY YUMA PROVING GROUND

April 2013

U.S. Army Garrison Yuma Proving Ground
Environmental Sciences Division
Yuma, Arizona 85365

ACRONYMS AND ABBREVIATIONS

ADEQ	Arizona Department of Environmental Quality	**MAA**	Main Administrative Area
AR	Army Regulation	**NEPA**	National Environmental Policy Act
AGFD	Arizona Game and Fish Department	**LRM**	Long range munitions
AGFD	Arizona Game and Fish Department	**NHPA**	National Historic Preservation Act
BLM	Bureau of Land Management	**NRHP**	National Register of Historic Places
BMP	Best Management Practice	**NOx**	Nitrogen Oxides
CAA	Clean Air Act	**NO_2**	Nitrogen dioxide
CEQ	Council on Environmental Quality	**NWR**	National Wildlife Refuge
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	**O_3**	Ozone
CFR	Code of Federal Regulations	**Pb**	Lead
CO	Carbon Monoxide	**$PM_{2.5}$**	Particulate Matter (2.5 microns or less in diameter)
CWA	Clean Water Act	**PM_{10}**	Particulate Matter (10 microns or less in diameter)
DoD	Department of Defense	**RCRA**	Resource Conservation and Recovery Act
EA	Environmental Assessment	**SDZ**	Surface Danger Zone
EPA	U.S. Environmental Protection Agency		
ESA	Endangered Species Act	**T&E**	Threatened and Endangered (species)
FNSI	Finding of No Significant Impact	**tpy**	tons per year
Garrison	U.S. Army Garrison Yuma Proving Ground	**USFWS**	United States Fish and Wildlife Service
GP	gun position	**UXO**	Unexploded Ordnance
HMA	Herd Management Area	**VECS**	Valued Environmental Components
HMAP	Herd Management Area Plan	**VOC**	volatile organic compound
JERC	Joint Experimentation Range Complex	**WSC**	Wildlife of Special Concern
KFR	Kofa Firing Range	**YPG**	Yuma Proving Ground
LRM	Long Range Munitions	**YTC**	Yuma Test Center

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1.0 PURPOSE OF AND NEED FOR PROPOSED ACTION

1.1 INTRODUCTION

The National Environmental Policy Act (NEPA; 42 United States Code 4321 *et seq.*), the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508), Department of Defense (DoD) Directive 4715.9, *Environmental Planning and Analysis* (1996), and *Environmental Analysis of Army Actions* (32 CFR Part 651; March 29, 2002) requires environmental analysis of Army actions affecting human health and the environment.

This Environmental Assessment (EA) analyzes potential environmental impacts associated with designating and establishing new gun positions and impact areas in the Cibola Region of U.S. Army Yuma Proving Ground (YPG).

1.2 BACKGROUND

YPG encompasses over 1,300 square miles of Sonoran Desert in southwestern Arizona and is located approximately 24 miles northeast of Yuma, Arizona (Figure 1). U.S. Army Garrison Yuma Proving Ground (Garrison) manages the land, facilities, and infrastructure that comprise YPG in support of Yuma Test Center (YTC) and other components. YTC provides a flexible, responsive, innovative, and diverse set of testing capabilities and services in a desert environment in order to meet the current and future needs of the U.S. Armed Forces. YTC has established a mission and vision statement (see inset) as a tool to guide planning and development to meet current and future testing and training needs.

YUMA TEST CENTER

MISSION
Plan, conduct, and report the results of materiel testing for DoD and other customers. Facilitate troop training on YPG land space and in YPG airspace and ensure that training is done safely.

VISION
A premier "Test Center of Excellence" which focuses on doing its missions well and delivers products of high quality to ensure that warfighters have the right tools to perform their missions successfully.

YTC is the Army's primary test center for indirect fire systems. The latest developments of indirect fire systems are focusing on long range munitions (LRM). These types of munitions are typically missiles, howitzer, mortar, and rocket fired projectiles that may be comprised of integral guidance and control systems, which enable them to achieve extended range with high precision. Examples of LRM weapon/ammunition systems include but are not limited to the following:

- Army 155 mm Excalibur
- Army Projectile Guidance Kit
- Navy 5-inch Extended Range Guided Projectile
- Navy 155 mm Advanced Gun System
- Navy Low Cost Precision Munitions System for Naval Guns Systems
- Army Precision Guided Mortar Munitions
- Accelerated Precision Mortar Initiative

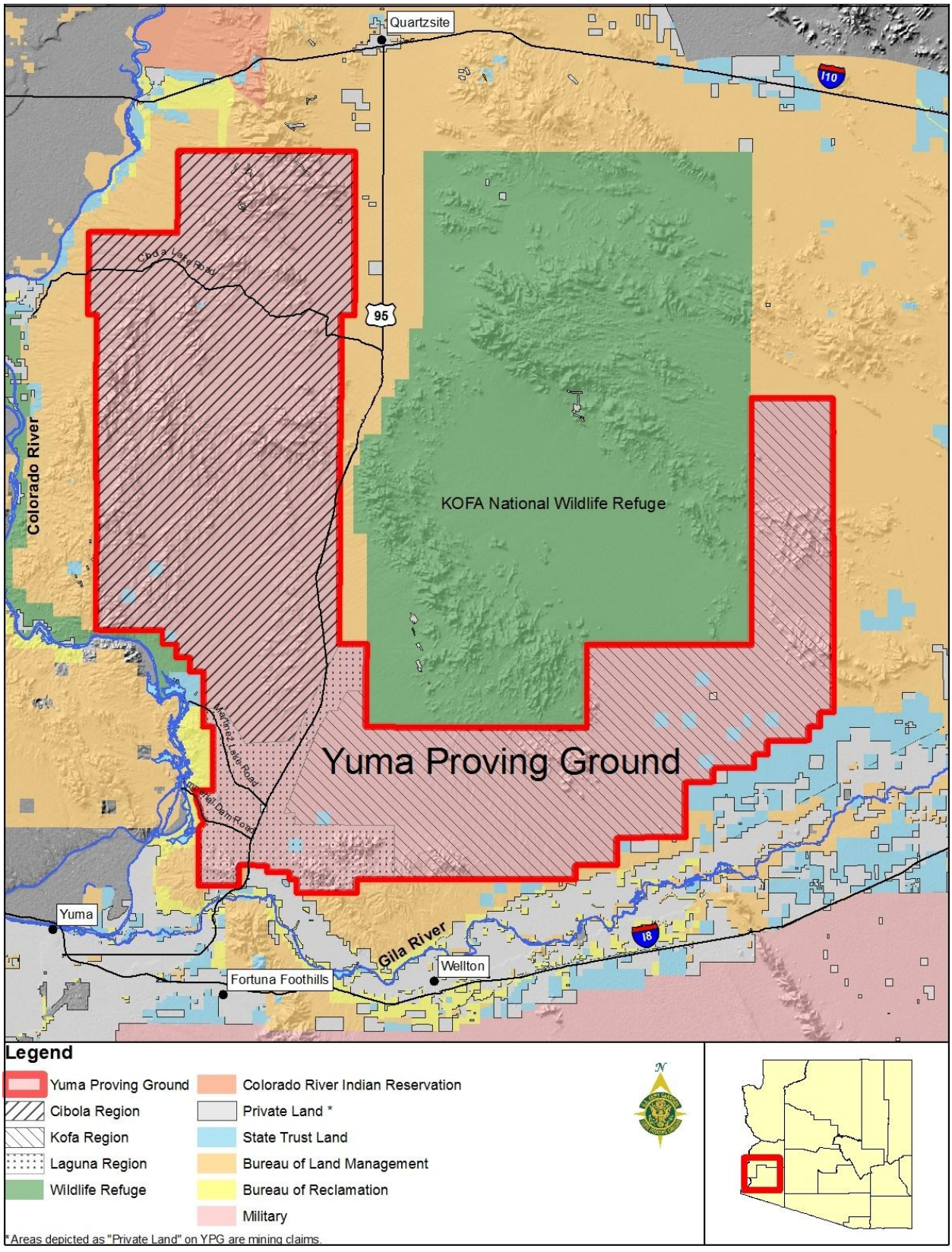

Figure 1. General Location of YPG and Surrounding Land Use

The safety footprint or Surface Danger Zone (SDZ) for LRM varies in size depending on the projectile and the test objective, and identifies the boundaries of the hazardous area or danger zone based on the characteristics of the item under test. They consist of a series of ever widening perimeters drawn around the line of operation that defines the normal or expected behavior of the projectile. The perimeters are drawn as the boundaries of increasingly smaller probabilities, with the outside perimeter representing the maximum area endangered given the worst-case failures and the physics controlling the event. For experimental or developmental items, test sponsors or manufacturers are required to propose a SDZ, preferably one that delineates a one in a million or more probability. Some tests conducted by YTC are in support of generating or refining these SDZs for experimental and developmental munitions.

Historically, LRM programs have conducted testing activities primarily in the Kofa Region (i.e., Kofa Firing Range or KFR) of Yuma Proving Ground. There are also a limited number of existing gun positions and impact areas in the Cibola Region that are currently used by LRM programs to conduct firing missions.

Garrison proposes to establish additional gun positions and impact areas to support current and future LRM test activities. Other YTC programs could also use the new LRM sites to support of mission activities that require similar site conditions and parameters (see section 2.2.1 and 2.2.2).

1.3 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The purpose of the proposed action is to provide additional gun positions and impact areas on YPG that will accommodate the extended range and SDZs associated with LRM test activities. Some of the sites currently used for LRM testing can accommodate the distance to target and the associated SDZs, however, many of the LRM platforms require longer range to target than the existing sites can accommodate, or the associated SDZs extend beyond the installation boundary. Therefore, LRM programs needs to establish additional sites that will provide extended range to targets and accommodate the larger SDZs within the installation boundaries.

1.4 SCOPE OF ANALYSIS

This EA has been prepared to assess the potential impacts to the natural and human environment associated with implementing the proposed action at YPG and the impacts associated with alternatives considered, including the "no action" alternative.

The evaluation of affected resources and the potential for environmental consequences initially encompassed a broad range of Valued Environmental Components (VECs); however, the potential for environmental impacts to some of the resource areas was determined to be nonexistent, unlikely, or negligible and were not carried forward for further detailed analysis (see discussion in Chapter 3). As a result, YPG determined that the proposed action could potentially affect the VECs listed below; therefore, the focus of the analysis in this EA is on these resource areas.

- Air Quality
- Biological Resources
- Cultural Resources
- Health and Safety
- Land Use, Recreation, and Airspace
- Soil Resources
- Transportation and Infrastructure
- Water Resources

Chapter 3 provides a description of these VECs and their context in relation to the proposed action.

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES CONSIDERED

2.1 INTRODUCTION

The proposed action is to establish gun positions and impact areas that will accommodate the extended range required by LRM programs to continue to conduct testing activities of these advanced munitions.

YTC considered a range of alternatives to accomplish the proposed action and the YPG Real Property Planning Board (RPPB), composed of representatives from mission, engineering, construction, environmental, etc…, was involved in selection and approval of the proposed LRM sites (see figure 2). The following criteria were consider during the planning process and used to evaluate each alternative considered.

- Provide range to target (Impact Area) that is between 2.5 miles and up to 31 miles in distance from the firing point (Gun Position)
- SDZs associated with firing of LRM would be contained within the installation boundaries
- Be located with an existing Restricted Airspace classification/designation (surface up to at least 50,000 feet)
- Avoid conflict with current testing activities (i.e., avoid incompatible activities such as air cargo personnel drop tests)
- Avoid interference or potential to damage existing infrastructure (e.g., buried fiber optic cable, roads)
- Use previously disturbed or developed sites to the extent possible
- Provide suitable site topography (relatively flat terrain)
- Avoid major drainages to the extent possible

Using information gained from that effort, YPG designed the Proposed Action with minimal impact on natural resources and land uses, to the extent practicable. Based on the above criteria one action alternative was carried forward for detailed analysis in this EA, Alternative A (proposed action), which is presented in Section 2.2. The no action alternative is also included in this environmental analysis, as required by CEQ regulations (40 CFR 1502.14(d)), and serves as a benchmark against which the environmental consequences of the proposed action and other alternatives considered can be evaluated. Section 2.3 contains a description of the no action alternative. Section 2.4 of this EA discusses other alternatives considered but subsequently eliminated from further detailed analysis.

Activities and projects addressed in this EA do not eliminate the need to submit a work order (DA 4283), service order, or other required documents (e.g., dig permits) for the proposed actions required for site development. Further, these actions may still require other environmental permit applications (e.g., storm water or 404 permits) and state or federal regulatory agency approvals.

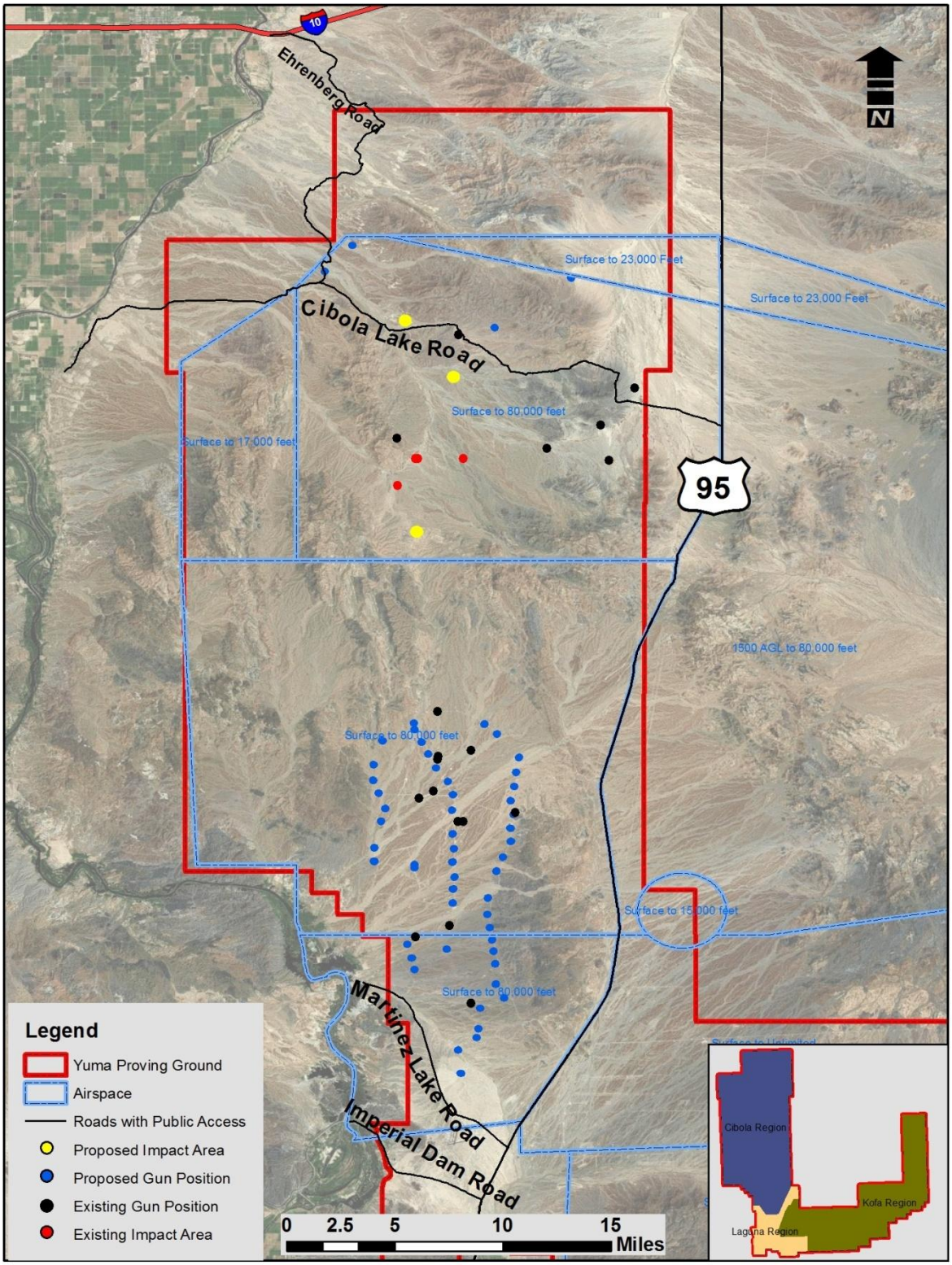

Figure 2. Location of Proposed LRM sites and YPG Restricted Airspace

2.2 ALTERNATIVE A (PROPOSED ACTION) – LRM GUN POSITIONS AND IMPACT AREAS IN CIBOLA REGION

Under Alternative A, YPG will establish 56 additional sites for gun positions and sites for 3 new munitions impact areas in the Cibola Region. Table 1 provides a list of the sites proposed in the Cibola Region to accommodate the extended range of these munitions and a brief description of current conditions at each site. Aerial imagery or a representative photograph that depict the existing conditions at each of the proposed sites is provided in Appendix A. Mitigation measures are included in the proposed action to reduce the potential for significant effects. These measures are described in Chapter 3, as applicable, under specific resources.

The proposed sites could also be used to support a wide variety of individual tests of indirect fire systems or munitions, direct fire systems or munitions, unmanned aircraft system testing, sensor (laser, radar, optical, acoustical) testing, and/or they can support operational user assessments, distributed or network integration test events.

The sites listed in Table 1 and associated activities described below are those needed to support current LRM programs and work load. As testing of LRM platforms continues at YPG new test requirements may develop. These developments could require additional sites to be identified and established on the installation and YPG will conduct appropriate planning including NEPA analysis for any additional sites needed.

2.2.1 Gun Positions

Weapons systems set up at the proposed gun positions may include small and large caliber/size platforms for ground fired/launched systems (mortars, tanks, artillery pieces, rocket launchers, shoulder fired, etc.) or aerially fired/launched systems (unmanned aerial vehicles, helicopter, etc.). The following preparation and activities may occur at some or all of the gun positions depending on test requirement, topography, and existing access conditions. Figure 3 provides an example of a typical gun position layout during a test event.

- Smooth and grade discrete portion of the sites to provide a level site for emplacement of weapon system, instrumentation, and vehicle parking.
- Lay down an Aggregate Base Course material to stabilize soil and control dust.
- Establish access roads where maintained roads or existing two-track roads are not available[1]. A grader would be used to construct required access roads up to a width of 20 feet.
- Set up temporary/mobile facilities during test activities, including data acquisition vans, bomb shields/barriers, portable generators, and portable lavatories (port-a-potties).
- Set up temporary or permanent instrumentation (e.g., radar, radio frequency transmitters, antenna arrays)

[1] Existing access (maintained or two-track roads) is currently available to 29 of the proposed sites and 27 will require some improvement or creation of access roads, as indicated in Table 1.

Table 1. Proposed Gun Positions and Impact Area

Site Type and ID	Existing Condition/Access	Access Road [a] (acres)	Frequency [b] (times per year)
Impact Areas			
Trigo	No existing ground disturbance	0.56	> 5
Tong Peak	No existing ground disturbance	0.38	> 5
Mohave	No existing ground disturbance, hilly land form	Existing access	> 5
Gun Positions			
HH 26K	Existing ground disturbance	Existing access	< 3
HH 27K	Existing ground disturbance	Existing access	< 3
HH 29K	No existing ground disturbance	Existing access	> 5
HH 30K	Existing ground disturbance	Existing access	> 5
MM 23K	Existing ground disturbance	Existing access	< 3
MM 24K	Existing ground disturbance	Existing access	< 3
MM 25K	Slight existing ground disturbance, located in large (braided) drainage system	Existing access	< 3
MM 26K	Existing ground disturbance	0.09	< 3
MM 27K	No existing ground disturbance	0.13	< 3
MM 28K	Existing ground disturbance	0.07	< 3
MM 29K	Existing ground disturbance	0.06	> 5
MM 30K	Existing ground disturbance	Existing access	> 5
MM 31K	Existing ground disturbance	0.08	> 5
MM 33K	Existing ground disturbance	0.49	< 3
MM 34K	Slight existing ground disturbance, located in large (braided) drainage system	0.13	< 3
MM 35K	Existing ground disturbance	Existing access	< 3
MM 36K	Existing ground disturbance	Existing access	< 3
MM 37K	Existing ground disturbance	0.13	< 3
MM 38K	Existing ground disturbance	0.27	< 3
RH 20K	No existing ground disturbance	0.03	< 3
RH 21K	Existing ground disturbance	0.05	< 3
RH 22K	Existing ground disturbance	0.10	< 3
RH 23K	Existing ground disturbance	Existing access	< 3
RH 24K	Existing ground disturbance	0.20	< 3
RH 25K	Existing ground disturbance	Existing access	< 3
SW 44K (44 KM)	Existing ground disturbance	0.05	> 5
SW 45K (45 KM)	Existing ground disturbance	0.20	> 5
TB 20K	Existing ground disturbance	Existing access	< 3
TB 21K	Existing ground disturbance	Existing access	< 3

Site Type and ID	Existing Condition/Access	Access Road [a] (acres)	Frequency [b] (times per year)
WTB 21K	Existing ground disturbance, sloped terrain with some boulders	Existing access	< 3
WTB 23K	Existing ground disturbance	Existing access	< 3
WTB 24K	No existing ground disturbance, located in large (braided) drainage system	Existing access	< 3
JERC 1	Existing ground disturbance	Existing access	4
JERC 2	Existing ground disturbance	Existing access	4
Wraith	Existing ground disturbance	0.14	< 3
CB 28K	Existing ground disturbance	Existing access	> 5
CB 29K	Existing ground disturbance	Existing access	> 5
CB 30K	Existing ground disturbance	Existing access	> 5
CB 31K	Existing ground disturbance	Existing access	> 5
CB 32K	Existing ground disturbance	Existing access	> 5
CB 33K	Existing ground disturbance	Existing access	4
Chem Test 43K	Minimal existing ground disturbance	0.40	> 5
Rocket Alley 41K	Existing ground disturbance	0.09	> 5
SITE 13 25K	Existing ground disturbance	Existing access	< 3
Rocket Alley	Existing ground disturbance, buildings and structures present	Existing access	> 5
48 KM	Existing ground disturbance	0.03	< 3
Ehrenburg	Partially disturbed, Ehrenburg Road runs through the western portion of the site	Existing access	< 3
19.7 KM	Existing ground disturbance	Existing access	< 3
DFR	Existing ground disturbance	0.13	> 5
DFR 2	Existing ground disturbance	Existing access	> 5
36 KM	Existing ground disturbance	0.05	4
36KM & 25.4 KM	Existing ground disturbance	Existing access	4
37 KM	Existing ground disturbance	0.10	4
27.7 KM	Existing ground disturbance	0.71	4
OP CUB	Existing ground disturbance	Existing access	4
OP GRIZ	Existing ground disturbance	Existing access	> 5

(a) The area shown is based on the current condition of the site and an estimate of potential surface disturbance to establish access roads that are up to 20 ft wide.
(b) Estimated number LRM testing events that may occur annually at each site.

- Delineate the designated footprint and access point(s) using natural boundaries (washes, etc) or by placing stakes (lath or cyber) at ingress/egress and perimeter prior to active tests, as needed or practicable.
- Set up mobile conditioning chambers at an adjacent gun position (500 to 1,000 meters) that is outside the SDZ.

Temperature conditioning of the munitions is a typical requirement during test firing events. This is accomplished using specialized mobile temperature conditioning chambers that can accommodate ammunition (projectiles, propelling charges, fuses, and primers) and maintain them at a constant high or low temperature for an extended period. Other adjacent gun positions are commonly used to temporarily locate/park these conditioning chambers. The gun position used to set up the mobile conditioning chamber may be an existing gun position or one of the proposed gun positions. Test support personnel tow the conditioning chambers to the desired location and mobile generators provide electrical power.

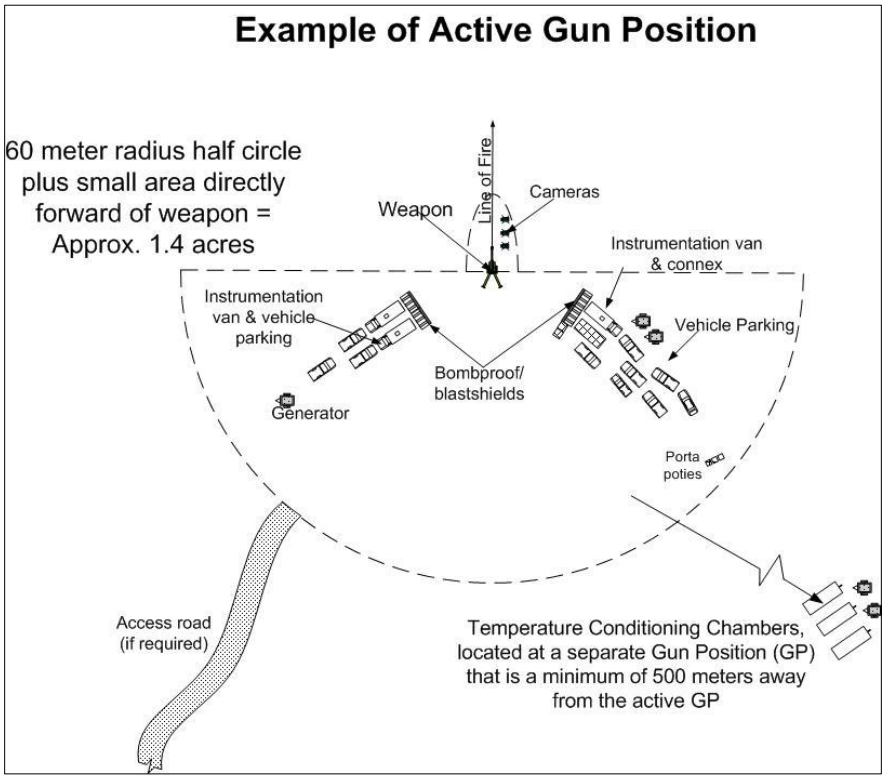

Figure 3. Typical Layout of an LRM Gun Position During an Active Test

2.2.2 Impact Areas

The proposed impact areas are in locations with relatively flat terrain, which allows for good observation of munitions impacts and facilitates placement of target vehicles, target structures, and instrumentation to record and capture data during test events.

Guided and unguided munitions fired into the proposed impact areas may include High Explosive, Illumination, Obscurant, Training/Practice, White Phosphorus, and a variety of Inert warheads. Specialized munitions such as flares, illumination, chaff, etc. may also be fired or dispensed during testing.

The following preparation and activities may occur at some or all of the impact areas depending on existing topographical and access conditions. Figure 4 provides an illustration of a typical impact area configuration.

- Set up stationary or moving targets as needed on a test-by-test basis
- Limited leveling of discrete areas for placement of targets and instrumentation (clearing and leveling of the entire impact areas is not required)
- Set up cameras and instrumentation
- Establish access roads into impact areas and trails within the impact area to target positions, as needed

Multiple targets could be placed at various locations within a 150 m radius of the center point of the impact area (Figure 4). All target areas within an impact area would be located to ensure that there is a 50 meter safety buffer. Figure 5 shows a typical observation/camera platform with a raised panel target in the background.

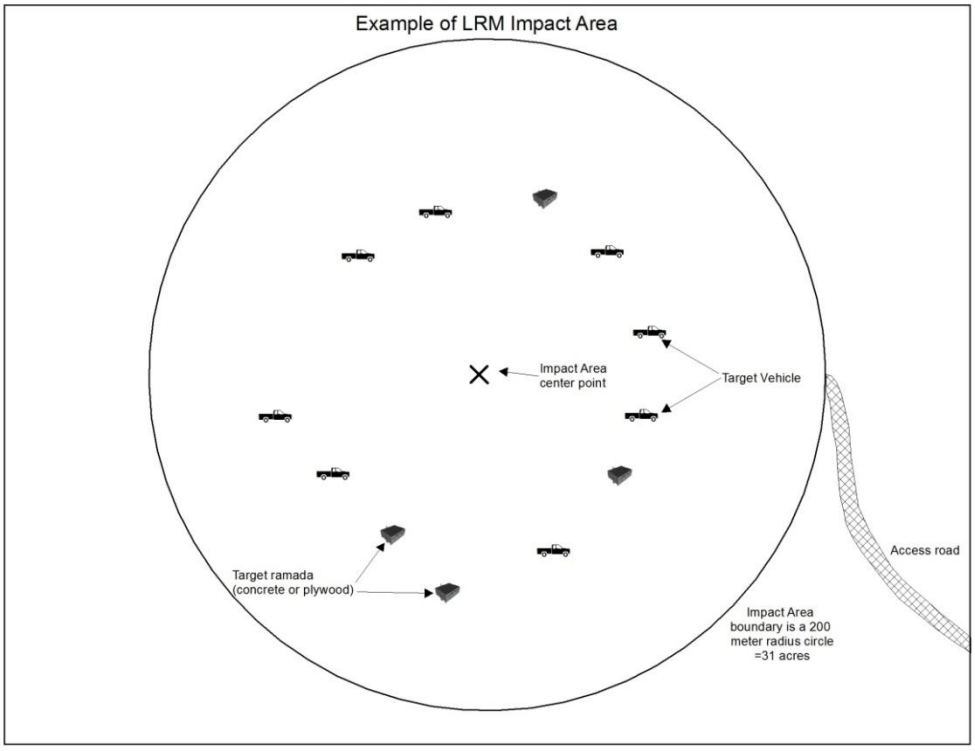

Figure 4. Typical Layout at a LRM Munitions Impact Area During an Active Test

Figure 5. Example of a Temporary Camera Platform at an Active Impact Area

2.3 NO ACTION ALTERNATIVE

Under the no action alternative, additional gun positions and impact areas would not be established to support LRM test activities. The no action alternative would severely limit YPG's ability to conduct LRM tests within established safety protocols and without adversely impacting surrounding land use.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

During the planning process, YPG considered a range of areas and sites to meet the purpose and need of the proposed action, however, they were eliminated because they did not meet one or more of the selection criteria (see section 2.1).

Expand LRM testing in the Kofa Region - Establishing additional sites on Kofa Firing Range (KFR) was considered, however, KFR does not provide the distance to target required to accommodate current and future LRM testing on the installation. In addition, the SDZs associated with many of the LRM munitions tests would extend outside the YPG boundary into public areas or the Kofa National Wildlife Refuge.

Alternate sites in the Cibola Region – YPG considered several sites in the Cibola Region, however, many were eliminated because they did not meet the distance to target or SDZ criteria, and others were eliminated or moved to avoid conflict with existing mission activities or to avoid or minimize potential environmental impacts.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Environmental effects can be direct, indirect, or cumulative and of a short-term, temporary nature or longer-term and more permanent. Direct effects are those caused by the action and occur at the same time and place. Indirect effects are those that are reasonably foreseeable consequences of the action but are later in time or further removed in distance from the direct effects. Cumulative effects are those effects resulting from the incremental effect of an action when added to other past, present, or reasonably foreseeable actions regardless of what agency or person undertakes such other actions.

The assessment of potential impacts of implementing the action and its significance was made based on the requirements set forth in 40 CFR 1508.27. Impacts are evaluated at three levels: (1) no impact—no impact to the resource is predicted; (2) no significant impact—an effect is predicted, but the impact does not meet the intensity/context significance criteria for the specific resource; and (3) significant impact—an effect (either beneficial or adverse) that meets the intensity/context significance criteria for the specific resource is expected.

All known mitigating measures have been included in the proposed action. It is assumed that the proposed action will be implemented as described, using accepted guidelines, standard operating procedures, and best management practices (BMPs); therefore, consequences described below are short-term, temporary and less than significant in most cases.

The analysis of the affected environment related to LRM programs at YPG initially considered a broad range of resources or VECs. The evaluation of affected resources and the potential for environmental consequences conducted by YPG included the VECs listed below; however, they were not carried forward for further analysis because the potential for environmental impacts to these resources was determined to be nonexistent, unlikely, or negligible. This process allowed the analysis to focus on those resource areas where potential for an effect associated with implementation of the proposed action was greater.

Coastal Zone Management: The primary focus of the Coastal Zone Management Act is to effectively manage to preserve, protect, develop, restore, or enhance the resources of the nation's coastal zones. YPG is not located in a coastal area, and there are no activities planned in the proposed action that would impact any coastal resources.

Environmental Justice: Activities proposed will not disproportionately affect minority and/or low-income populations through substantial degradation of air or water quality or exposure to hazardous materials, substances, or waste.

Floodplains: Executive Order 11988 *Floodplain Management* restricts federal agencies from constructing in a floodplain. No construction or other modification of a floodplain area is proposed.

Geology and Geography: The scale of activities proposed cannot reasonably be expected to affect these large-scale resource areas; therefore, they were not carried forward for detailed analysis.

Hazardous and Toxic Substances: Use of regulated substances as a result of the proposed action would be limited to fuel consumption from vehicle use, operation of generators, and firing of munitions and will be managed in accordance with applicable guidance and regulations.

Meteorological Conditions (Climate): The CEQ Guidance on Federal Greenhouse Gas Accounting and Reporting (CEQ 2010) defines six types of greenhouse gases of concern because of their heat-trapping abilities and atmospheric lifetimes and thus their global warming potential. The scope and scale of activities associated with the proposed action would result in insignificant local or regional emissions of greenhouse gases, primarily from vehicle and generator use during testing, and would not affect meteorological conditions or result in changes in

climate.

Noise: YPG commissioned a noise study and management plan to determine the extent (USAPHC, 2011) that operational noise was traveling beyond the installation boundaries. Noise contour maps from the study indicate that all Zone II and III areas[1] are contained within the bounds of the installation with the exception of one small area located in a remote portion of the Kofa NWR (USAPHC, 2011); therefore, potential noise impacts were eliminated from further analysis.

Prime Farmland: The Farmland Protection Policy Act protects prime or unique farmlands from unnecessary and irreversible conversion to non-agricultural uses. YPG does not contain prime farmlands; therefore, no activities associated with the proposed action will affect any prime farmland.

Socioeconomic Values: The proposed action takes place entirely on YPG and would not have potential impacts associated with employment, income, or conflicts with county and local plans, population growth, displacement of persons and businesses, or community disruption.

Visual and Aesthetic Resources: The proposed action will not obstruct a scenic view or have a substantial adverse effect on a scenic vista that is visible from public viewing areas.

Wild and Scenic Rivers: A wild and scenic river, defined as a free-flowing river or segment of a river that has exceptional scenic, recreational, geologic, fish and wildlife, historic, cultural properties, or other similar values, can be designated by act of Congress or by the Secretary of the Interior at the request of a governor as part of the National Wild and Scenic Rivers system. There are no designated Wild and Scenic Rivers located on Yuma Proving Ground.

Analysis of impact significance was evaluated based on the significance criteria used in the *U.S. Army Yuma Proving Ground Range Wide Environmental Impact Statement*, (U.S. Army Yuma Proving Ground, 2001) and adapted for use in this analysis. The significance criteria were developed using compliance standards, best professional judgment, and stakeholder input. Table 2 provides a listing of the VECs carried forward for detailed analysis and the significance criteria used to evaluate potential impacts. The following sections provide a description of these VECs and their context in relation to the proposed action and potential environmental consequences.

[1] The U.S. Army Public Health Command (formerly the U.S. Army Center for Health Promotion and Preventive Medicine) has developed noise zones to assess military-related noise effects, which consider noise levels along with sociological considerations and compatible land uses. Land use contours are not meant to imply that sound generating activities cannot be heard beyond the YPG boundary, only that the level of sound does not meet the land use restriction threshold. Land use activities in Zone III areas are those that are not likely to be impacted by sound levels such as industrial activities or the firing positions on the Kofa Range. Land use activities in Zone II areas are restricted to administrative type activities. Zone I areas are unrestricted and the only areas where sensitive receptors, schools, and medical activities for example, can be located.

Table 2. Significance Criteria Used to Evaluate Environmental Effects

VEC	Significance Criteria Used In This Analysis
Air Quality	• Emissions exceed air quality standard established under the Clean Air Act • Contributes considerably to an existing air quality violation • Exposes sensitive receptors to substantial pollutant concentrations • Results in an increase of a criteria pollutant for any designated non-attainment area
Biological Resources	• Habitat necessary for all or part of the life cycle of a species is lost because of the proposed action (e.g. lambing areas, migratory corridors, or wildlife watering areas) • Threatened or endangered species are adversely affected • A regional or local species is extirpated • Ecological processes are damaged to the extent that the ecosystem is no longer sustainable or biodiversity is impaired
Cultural Resources	• Prehistoric and historic sites eligible for the National Register of Historic Places are adversely affected • Native American religious or other cultural activity areas are adversely impacted
Health and Safety	• Public or YPG personnel health or safety is adversely affected • Established Federal, State, and local health and safety laws and regulations are violated • A new off-post safety hazard is created
Land Use, Recreation, and Airspace	• Land is degraded so it cannot be used for current or planned use • Results in conflicts with existing YPG land uses and established off-post land use (especially along the boundary) • Eliminates the regional availability of a recreational opportunity • Results in long-term closure of an important public access point
Soil Resources	• Activities result in severe soil erosion or sedimentation • Soil subsidence occurs over large areas • Permanent contamination of soil occurs that would restrict future land use
Transportation and Infrastructure	• Transportation characteristics are reduced to a level that impacts safety or movement of people, goods, and services • Utilities or infrastructure are taxed beyond their capacity to support installation mission requirements • A substantial negative effect to the YPG mission occurs
Water Resources	• Surface water is contaminated by storm water runoff to levels above Federal or State water quality standards • "Waters of the U.S." are degraded by actions that exceed limits authorized under the Clean Water Act, as amended • Groundwater is depleted to the degree that subsidence causes fissures to form • Groundwater quality is degraded below established Clean Water Act standards • Substantially alters the existing drainage pattern of the site or area, including the alteration of the course of a wash, stream, or river in a manner that would result in substantial erosion, siltation, or flooding onsite or offsite

3.1 AIR QUALITY

The Clean Air Act (CAA), as amended, establishes National Ambient Air Quality Standards (NAAQS) for the control of air contaminants or criteria pollutants to protect human health and the environment, and to prevent adverse effects to national air resources. The Arizona Department of Environmental Quality (ADEQ) has adopted the U.S. Environmental Protection Agency (EPA) federal standards (http://www.epa.gov/air/criteria.html) as the Arizona Ambient Air Quality Standards, and the ADEQ Air Quality Division regulates and enforces these standards in Arizona.

3.1.1 Nonattainment of NAAQS and Conformity Determination

Criteria pollutants with established primary and secondary NAAQS are carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), lead (Pb), sulfur dioxide (SO_2), and particulate matter equal to or less than 10 microns in size (PM_{10}) and equal to or less than 2.5 microns in size ($PM_{2.5}$). Areas that do not meet the standards set for these pollutants are called "nonattainment" areas. ADEQ, in conjunction with the EPA, has defined areas that are in nonattainment of the NAAQS. Portions of Yuma County were designated a moderate nonattainment area for the 24-hour standard of PM_{10}. Mobile emission sources, such as vehicular and agricultural equipment emissions, and blowing dust are the primary contributors to air pollutant emissions in this region. The Yuma PM_{10} nonattainment area is located in the southwestern potion of Yuma County comprising about 456 square miles or 300,000 acres. The nonattainment area is defined as follows (40 CFR 81.303):

- Township 7S, Ranges 21 and 22W,
- Township 8S, Ranges 21-24W,
- Township 9S, Range 21-25W, and
- Township 10S, Ranges 21-25W

A small portion of YPG is located in Township 7S, Range 21W and falls within the Yuma PM_{10} nonattainment area; however, none of the existing or proposed LRM sites are within the PM_{10} nonattainment area on the installation.

3.1.2 Construction and Operating Permits

Title I and Title V of the CAA contain mandated regulations for the implementation of construction permitting programs and operating permit programs, respectively. ADEQ has combined these programs and requires a facility with emissions to obtain permits for all existing stationary sources of air emissions and any future stationary sources of air emissions. Due to potential emissions of nitrogen oxides (NO_x), CO, and volatile organic compounds (VOCs) exceeding 100 tons per year (tpy), YPG is classified as a Class I Major Source pursuant to Arizona Administrative Code R18-2-101.64, and ADEQ issued YPG a Title V Air Permit (#43492) in June of 2010.

Generators (driven by internal combustion engines) are used in areas on the range that do not have access to electrical lines or hard power in order to operate necessary equipment to support test programs such as lights, air conditioners, data acquisition equipment, and computers. The

YPG Title V Air Permit has specific requirements for operation, record keeping, and reporting associated with generators[1] (Arizona Department of Environmental Quality, 2010).

Under Title V, YPG submits an annual air emissions inventory to ADEQ that reports emissions of criteria pollutants. Data from the most recent YPG air emissions inventory (2011) and Yuma and La Paz counties (2008) are presented in Table 3. These data show that emissions from point sources at YPG account for a very small fraction of total emissions in the region.

Table 3. Yuma County, La Paz County and YPG Air Emissions for Criteria Pollutants

	Yuma County [(1)]	La Paz County [(1)]	YPG [(2)]
Pollutant	**Total (tpy)**	**Total (tpy)**	**Point Source (tpy)**
CO	34,765	11,551	2.95
NO_X	6,782	2,079	0.31
Pb	1	0.7	0.27
SO_2	184	34	0.78
VOCs	8,203	2,206	13.75
PM_{10}	12,661	3,246	1.46
$PM_{2.5}$	2,615	708	0

[(1)] Source: http://www.epa.gov/air/emissions/where.htm. Note: Most recent data available is from 2008.
[(2)] Source: Yuma Proving Ground 2011 Annual Air Emission Inventory.

3.1.3 Environmental Consequences and Mitigation

Minor, localized, and short-term increases in dust and air emissions would occur from activities associated with the establishment of new gun positions and impact areas in the Cibola Region. Emission sources would mostly be limited to vehicular equipment used to transport testing equipment and personnel to the project areas.

The emissions would primarily consist of fugitive dust and compounds released from burning of fossil fuels in vehicular equipment and generators. Emissions from motorized vehicles would contribute only a small amount of pollutants for the testing period; therefore, impacts would be negligible. Dust emissions from test site construction and travel activities would be localized and would be minimized as needed with appropriate BMPs and dust abatement measures (such as watering, chemical suppressants, or placement of gravel) to prevent significant deterioration of air quality. Emission limits established under the CAA would not be exceeded and total direct and indirect emissions from implementing the proposed action would be at *de minimis* levels and below the conformity threshold value established at 40 CFR 93.153(b).

The project area is currently in attainment for all NAAQS. None of the existing or proposed sites are located within the Yuma County PM_{10} nonattainment area, and no sensitive receptors are known to occur within the vicinity of any of the sites included under the proposed action. Applicable requirements and processes, in accordance with Attachment B, Section III of the YPG Air Permit (Arizona Department of Environmental Quality, 2010), such as operation limitations, monitoring and recordkeeping, and reporting, will be implemented in order to

[1] If generators are used for more than one year, they will be classified as "stationary sources" and will be added to the YPG Title V air permit. The units will be managed and operated in accordance with applicable provision specified in Attachment B. III (Internal Combustion Engines) of the YPG Title V Permit (#43492 June 4, 2010) and any pertinent amendments.

minimize the potential for increased emissions resulting from use of generators at the proposed LRM gun positions and impact areas.

3.2 BIOLOGICAL RESOURCES

The landforms and habitats found at YPG support many plant and animal species native to the Sonoran Desert. The following sections provide a summary description of vegetation and wildlife known to occur on the installation and those with potential to occur based on habitat requirements.

3.2.1 Vegetation

Vegetation in the Yuma area is within the Lower Colorado Valley Subdivision of the Sonoran Desert. The extreme aridity characterizing this region is reflected in open plains covered sparsely with drought-tolerant shrubs, grasses, and cacti. Most common is creosote bush (*Larrea tridentata*), found in widespread stands, or mixed with combinations of ocotillo (*Fouquieria splendens*), bursage (*Ambrosia* spp.), teddy bear cholla (*Cylindropuntia bigelovii*), and foothills paloverde trees (*Parkinsonia* spp.), depending on landform features (Turner and Brown, 1994; Shreve and Wiggins, 1964). The open plains are dissected with washes that can support less drought-tolerant plants. These plants, including trees, can grow in dense bosques throughout washes.

The Lower Colorado River Valley Subdivision prevails on low and gently sloping alluvial fans and terrace areas commonly referred to as bajadas. There are four plant communities (or series) of the Lower Colorado River Valley Subdivision that are represented on the installation:

- Creosotebush-White Bursage Series
  - *Creosotebush-White Bursage Association* - found on the flat alluvium of the lower bajadas.
  - *Creosotebush-Ocotillo Association* - occurs on upper bajadas and slopes at sites normally associated with shallow soils.
  - *Creosotebush-Foothill Paloverde Association* - found along runnels and minor washes.
- Mixed Scrub Series
- Creosotebush-Big Galleta Series
- Saltbush Series

Of these plant communities, the Creosotebush-White Bursage and the Cresotebush-Foothill Paloverde associations are represented at the locations proposed for LRM gun positions and impact areas. Appendix A includes imagery and brief descriptions of plant communities found at each proposed location.

Non-native Species

Non-native plant species from other parts of the world have colonized portions of YPG and can result in changes to community composition and species abundances, particularly in the annual grasses. This can prevent successful establishment of native annual plants (Van Devender et al., 1997), including food species of Sonoran desert tortoises (*Gopherus morafkai*). A few of the non-native plant species known to occur on the installation are described below.

Athel tamarisk (*Tamarix aphylla*) and Salt Cedar (*T. hybrid*): Athel tamarisk was originally planted on the Main Post sometime around 1954 and has since spread several miles downwind, mostly where water flow has been altered through road and other construction, and where water accumulation and retention occurs in low lying areas (e.g., borrow pits). Salt cedar (hybrids of various *Tamarix* spp., possibly *T. chinensis* and *T. ramosissima* [Gaskin and Schaal, 2002]) is another *Tamarix* group found on the installation that was established mostly as a result of human activity, such as the alteration of water flow. None of these species were observed at any of the proposed locations.

Sahara mustard (*Brassica tournefortii*), Mediterranean and Arabian grass (*Schismus barbatus* and *S. arabicus*, respectively): These species are exotic winter-spring annuals that compete with native annuals and grasses for rainfall, nutrients, and microhabitats and are widely naturalized in the Sonoran Desert. These species were observed at some of the proposed sites.

Buffelgrass (*Pennisetum cilare*): YPG staff have observed and reported small stands of this species on portions of the installation (primarily on the KFR). The YPG Environmental Sciences Division removes buffelgrass when it is identified and then monitors the location for at least three years for re-growth. This species was not observed at any of the proposed locations.

3.2.2 Wildlife

Wildlife on YPG is typical of Sonoran desert scrub habitat. Some species are restricted to specific plant associations whereas others range over a wide area. Common species observed at or near the proposed LRM gun positions and impact areas during surveys included mule deer (*Odocoileus hemionus*), mourning dove (*Zenaida macroura*), Gambel's quail (*Callipepla gambelii*) and side-blotched lizard (*Uta stansburiana*).

Other common species found on the installation that may transit the areas are coyote (*Canis latrans*), kit fox (*Vulpes macrotis*), gray fox (*Urocyon cinereoargenteus*), desert cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus*), round-tailed ground squirrel (*Spermophilus tereticaudus*), kingsnake (*Lampropeltis getula*), western diamondback rattlesnake (*Crotalus atrox*), Mohave rattlesnake (*Crotalus scutulatus*), sidewinder (*Crotalus cerastes*), roadrunner (*Geococcyx californianus*), turkey vulture (*Cathartes aura)*, red-tailed hawk (*Buteo jamaicensis*), and mockingbird (*Mimus polyglottos*). The proposed gun positions and impact areas are not located in proximity to water sources or wash woodlands that are used by desert bighorn sheep (*Ovis canadensis mexicana*).

3.2.3 Special Status Species

Special status species include those listed and protected under the Endangered Species Act (ESA) as threatened and endangered (T&E), the Arizona's Native Plant Law (Arizona Revised Statutes, Title 3, Chapter 7, Article 1), and Wildlife of Special Concern (WSC) in Arizona (Arizona Game and Fish Department [AGFD], 2013). Specific surveys have not been conducted for special status species for the entire installation (1,308 square miles). Table 4 presents a summary listing of special status species in Yuma and La Paz counties that have potential to occur at or near the proposed LRM sites based on habitat features or migratory patterns. Site-specific surveys for these species are conducted, as appropriate, to make a determination of effect for listed species with potential to occur in a project area.

Table 4. Listed Species with potential to occur at or near the Proposed LRM sites.

Nomenclature	Status*
Amphibians	
Lowland Leopard Frog (*Rana yavapaiensis*)	WSC (La Paz & Yuma counties)
Birds	
American Peregrine Falcon (*Falco peregrines anatum*)	WSC (La Paz County)
Bald Eagle (*Haliaeetus leucocephalus*)	WSC (La Paz & Yuma counties)
Southwestern Willow Flycatcher (*Empidonax traillii extimus*)	LE, WSC (La Paz & Yuma counties)
Mammals	
California Leaf-nosed Bat (*Macrotus californicus*)	WSC (Yuma County)
Lesser Long-nosed Bat (*Leptonycteris curasoae*)	
Sonoran Pronghorn (*Antilocapra americana sonoriensis*)	LE, WSC, XN (Yuma County)
Spotted Bat (*Euderma maculatum*)	WSC (Yuma County)
Western Yellow Bat (*Lasiurus xanthinus*)	WSC (La Paz & Yuma counties)
Plants	
Desert Christmas Tree (*Pholisma arenarium*)	HS (La Paz County)
Sandfood (*Pholisma sonorae*)	HS (Yuma County)
Saguaro (*Carnegiea gigantea*)	HS, SR (La Paz & Yuma counties)
Nichol's Turks Head Cactus (*Echinocactus horizonthalonius lemaire* var. *nicholii*)	LE, HS
Reptiles	
Flat-tailed Horned Lizard (*Phrynosoma mcallii*)	WSC (Yuma County)
Mohave Fringe-toed Lizard (*Uma scoparia*)	WSC (La Paz County)
Morafka's Desert Tortoise (*Gopherus morafkai*)	C, WSC (La Paz & Yuma counties)
Yuma Desert Fringe-toed Lizard (*Uma rufopunctata*)	WSC (Yuma County)

*Federal: LE = Listed Endangered, C = Candidate Species, R = Recovery, XN = Experimental Nonessential Population
State: WSC = Wildlife Species of Concern (AZ), HS = Highly Safeguarded (AZ), SR = Salvage Restricted (AZ)

NOTE: Only listed T&E species under the ESA, classified as WSC in Arizona, or those categorized as Highly Safeguarded and Salvage Restricted (HS, SR) under the AZ Native Plant law and that may be found at YPG are included in the table. A detailed list of protected plant species in Arizona can be found at the Arizona Department of Agriculture Website http://www.azda.gov/ESD/protplantlst.htm and detailed lists of federally protected species can be found on the U.S. Fish and Wildlife Service Website at http://ecos.fws.gov/tess_public.

Protected Native Plants

Several native plant species protected under Arizona's Native Plant Law are found at Yuma Proving Ground. Table 4 also includes those native plants with the highest protection status and YPG manages these species carefully when encountered in project areas. The only federally listed species is the Nichol's Turks head cactus (*Echinocactus horizonthalonius lemaire* var. *nicholii*), which is listed as endangered. This species was reported to have been seen and documented in the White Tanks area of the East Arm but subsequent surveys targeting this plant species have not found evidence or occurrence of it in the area previously recorded.

Protected Wildlife

Sonoran (Morafka's) desert tortoise: In December of 2010, the U.S. Fish and Wildlife Service (USFWS or Service) proposed the "Sonoran" population (desert tortoises that occur east and south of the Colorado River) of the desert tortoise (*Gopherus agassizii*) as a Candidate species for listing as Threatened or Endangered. Since that decision, this population of desert tortoise was proven to be a genetically distinct species and has been named Morafka's desert tortoise (*Gopherus morafkai*) (Murphy et al. 2011). According to the USFWS, recognizing the Sonoran desert tortoise as a new species confirms the Service's decision to evaluate this population

independently from the Agassiz's desert tortoise and will not change the status of either species under the ESA or change existing recovery plans (U.S. Department of Interior, 2011). The AGFD also classify the Sonoran desert tortoise as a "Species of Greatest Conservation Need." A low density population of Sonoran desert tortoises has been known to occur on YPG, particularly on the East Arm portion and throughout northern Cibola Range. More recently, two desert tortoises have been located on the far northeast corner of Cibola Range (Westland Resources Inc 2013).

Sonoran pronghorn: The USFWS and AGFD have implemented a project to re-establish the endangered Sonoran pronghorn (*Antilocarpa americana sonoriensis*) within its historic range, which includes the Kofa NWR, parts of the Barry Goldwater Range, and Yuma Proving Ground. As part of the re-introduction, the Sonoran Pronghorn Recovery Team has built a captive-breeding pen for Sonoran pronghorn within the central portion of Kofa NWR. This population is classified as a nonessential experimental population under section exception 10 (j) of the Endangered Species Act (ESA).

In January 2013, the USFWS released nine Sonoran pronghorn from the captive-breeding pens into King Valley in the Kofa NWR. Pronghorn released from the captive breeding pens may be encountered on YPG, particularly in the Kofa Region. However, since this population is classified as a nonessential experimental population the exception 10(j) take of pronghorn from the nonessential experimental population area is allowed on YPG: "...when it is incidental to, and not the purpose of, carrying out an otherwise lawful activity within the boundaries of YPG…" (USFWS, 2010: 43, 112). The only requirement on DoD lands is to report to the Service if incidental take occurs within one of the designated population areas because of military operations (USFWS, 2010).

Section 7 of the ESA requires conferencing on any project likely to jeopardize the continued existence of the species; however, pronghorn that may be encountered on YPG are within nonessential experimental population area established under exception 10 (j) of the ESA (Federal Register, Vol. 76, No. 87, May 5, 2011). Thus, conferencing is not required.

Southwest willow flycatcher: Southwest willow flycatchers are typically found in riverine habitat, especially within significant willow habitat. Although critical habitat for this species has been identified in Yuma County along the Colorado River, there is no riverine habitat near the project area, and therefore this species will not be affected by the proposed action.

Wild Horse and Burro: Some of the most conspicuous non-native animal species found on YPG are wild horses and burros *Equus* spp. Both species are managed by the Bureau of Land Management (BLM) under the Wild and Free Roaming Horse and Burro Act of 1971, Public Law 92-195, and Cooperative Management Agreement updated in September 1989. Management of these species is guided by the Cibola-Trigo Herd Management Area Plan (HMAP, 1980), and the Resource Management Plan (BLM 2010). Neither animal is considered wildlife by the AGFD as defined in the Wild and Free-Roaming Horse and Burro Act (1971). In the HMAP plan (2010), portions of the HMA east of Highway 95 were eliminated for safety reasons and the Herd Management Area (HMA) now includes portions of the Cibola and Laguna regions on YPG and public lands managed by BLM adjacent to these areas. Horses and burros mainly occupy those portions of YPG that are included within the Cibola-Trigo HMA. Burros and burro sign (tracks and scat) were found near all proposed gun placements and impact areas. YPG continues to cooperate fully with BLM in implementing the current HMAP.

3.2.4 Environmental Consequences and Mitigation

Habitat and vegetation communities found at each of the proposed LRM sites are common throughout the installation, and wildlife will be able to move to adjacent areas. There are no federally listed wildlife species known to occur within the boundaries of the proposed sites, and there are no species of federally protected native vegetation within the perimeter of the proposed gun positions or impact areas.

Impacts to wildlife could include disruptions in normal behavior such as feeding, breeding, or predation. Larger, mobile animals such as foxes, mule deer, and birds can avoid the activities. Smaller, less mobile species, such as lizards and snakes, may become injured or killed by vehicles or equipment operating in the project area. Disruptions to nesting behavior to birds may cause nest failure. 50 CFR part 21.15 provides authorization for take of migratory birds incidental to military readiness activities such as testing.

Sensitive bat species are unlikely to be affected by this project because the temporary gun placements and impact areas are not located near potential roost sites. Any impact to foraging bats would be minimal an intermittent.

Some of the habitat found on YPG is similar to habitat features associated with the Sonoran desert tortoise. Three gun positions (JERC 1, JERC 2, and 48 KM) and three impact areas (Trigo Impact, Tong Peak Impact, and Mohave Impact) may be within primary habitat for the Sonoran desert tortoise; however, a large portion of the proposed sites exist on previously disturbed uplands that do not exhibit characteristics consistent with suitable habitat for this candidate species. In the event that Sonoran desert tortoises are encountered during testing activities, Arizona Game and Fish Department Guidelines for Handling Sonoran Desert Tortoise Encountered on Development Projects (AGFD, 2007) will be followed for the removal of the tortoise(s) from immediate dangers or threats.

Pronghorn released on the Kofa NWR may move onto YPG, particularly in the Kofa Region. These animals are very mobile and would be able to avoid most human activity. The probability of death or injury to an individual pronghorn due to military activities is extremely low. No incidental take has ever been documented on Barry M. Goldwater Range or Luke Air Force Base (Federal Register, Vol. 76, No. 87, May 5, 2011).). The extent of any impact to pronghorn from this project would be restricted to YPG and would have no impact on populations of pronghorn located on Barry M. Goldwater Range, Cabeza Prieta NWR, Organ Pipe National Monument, or Mexico.

Since the temporary gun placements cover such a small area and will only be used intermittently (2 to 5 times per year), it is unlikely that this level of disturbance will have an impact on local wildlife populations. Temporary use of the site will allow wildlife to utilize the habitat and resources on and adjacent to the gun placement while not in use. Implementing mitigation measures from section 7.2.2 of the Integrated Natural Resources Management Plan (INRMP) will further reduce the likelihood of mortality for individual animals.

The following are standard mitigation management measures that will be implemented, as appropriate to eliminate or avoid adverse impacts to biological resources during site preparation activities.

- To the extent practicable, avoid and minimize disturbance during the breeding and nesting season of sensitive species to prevent injury and mortality of young.
- Avoid trimming trees during the breeding and migrating season (March 15th to September 15th).
- In the event a desert tortoise is discovered during training or testing, the tortoise shall be avoided. If necessary to move the tortoise coordinate with ESD and follow desert tortoise handling guidelines.
- Notify USFWS and AGFD if Sonoran pronghorn are observed on the installation or injured during mission activities.
- Modify project boundaries or location, if feasible, to minimize impact to sensitive species and habitats.
- Limit vehicle use to existing roads and facilities to the extent practicable.
- Conduct plant surveys for rare natives and plants listed in the Arizona Plant Law, and when feasible, protect in situ or remove and plant elsewhere if military activities will result in death of vegetation.
- Avoid accumulation and retention of water in unfenced areas that could attract wild horses and burros to the area or promote growth of non-native vegetation species.
- Wildlife permits in addition to the YPG scientific collecting permit (SP614327) will be obtained as required by law.

3.3 CULTURAL RESOURCES

Cultural resources include any prehistoric or historic district, site, building, structure, or object included on, or eligible for inclusion on, the National Register of Historic Places (NRHP), including artifacts, records, and material remains related to such properties or resources.

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, requires that federal agencies with jurisdiction over a proposed federal project take into account the effect of the undertaking on cultural resources listed, or eligible for listing, on the NRHP, and afford the State Historic Preservation Officer and the Advisory Council on Historic Preservation an opportunity to comment with regard to the undertaking. In order to facilitate this, YPG has performed numerous archaeological surveys to identify potential cultural resources.

Detailed information about cultural resources on the installation and their management is available in the YPG *Integrated Cultural Resources Management Plan* (Rhode and McDonald, 2012) and is hereby incorporated by reference in this environmental analysis. The following discussion focuses on cultural resources specific to the proposed action.

3.3.1 Area of Potential Effect

Under the no action alternative, no new LRM sites would be developed, and thus there would be no impact to cultural resources; therefore, the action alternative being considered comprises the Areas of Potential Effect with regard to cultural resources. The following discussion focuses on information specific to the proposed locations for additional LRM gun positions and impact areas in the Cibola Region.

Many prehistoric sites in this region are located on terraces above river floodplains and are surface manifestations with few diagnostic artifacts that can be dated to a specific prehistoric period. Prehistoric sites are common near the proposed LRM gun positions and impact areas and consist mainly of lithic artifact scatters, rock features, cleared circles, ceramic sherds, and trails or combinations thereof. Although cleared circles are a common feature at sites near the proposed LRM sites, recent and ongoing studies show that many of these features are natural occurrences and not manmade as originally thought (McAuliffe and McDonald, 2006; McDonald et al., 2004).

Historic sites tend to occupy transportation corridors along river valleys, between mountain ranges, and over mountain passes, and are often located at or near the same locations as prehistoric sites, indicating similar needs for access to water and other resources. Historic sites are scarce in the vicinity of the proposed LRM gun positions and impact areas.

3.3.2 Site-specific Cultural Investigations

All three proposed impact areas and forty-two of the gun positions were subjected to Class III pedestrian archeological surveys. Fifteen gun positions were not surveyed because they had previously been surveyed, are heavily disturbed, are within the footprint of an existing facility, or are a combination of the above.

A records search of the project area and surrounding one-mile radius showed 147 previously recorded archaeological sites within a one-mile radius of the 45 surveyed APEs. Forty-one are eligible for the NRHP, five have been determined not eligible, and the remaining 101 are of undetermined eligibility. Use of the proposed impact areas and gun positions will not adversely affect any of these cultural resources.

Two new archaeological sites and 29 isolated occurrences (single artifacts, features, or artifact concentrations that do not constitute an archaeological site) were recorded during the archaeological survey. USAG YPG determined that these resources are not eligible for the NRHP and that the proposed project will have no effect on historic properties; SHPO concurrence was obtained on both determinations on April 12, 2013.

3.3.3 Traditional Cultural Properties

In accordance with Section 106 of the NHPA, YPG Garrison is consulting with federally recognized Tribes who have expressed an interest in undertakings at Yuma Proving Ground. At this time, no traditional cultural properties have been identified that would be impacted by the proposed action.

3.3.4 Environmental Consequences and Mitigation

Consultation under Section 106 of the NHRP is ongoing; however, the proposed action is not anticipated to adversely affect prehistoric or historic sites eligible for the NRHP or Native American religious or other cultural activity areas. YPG will not issue a final decision document until the Section 106 consultation process is completed and any required mitigation is implemented.

Unanticipated discoveries of archeological remains may occur even in areas that have been previously surveyed. To avoid disturbance of known and previously undiscovered or undocumented cultural resources or remains, the following measures will be taken.

- Construction equipment and traffic will use existing roads or marked routes to access project sites.
- Grading and smoothing of surface soils will be confined to the delineated boundaries for LRM gun position or impact area.
- If archaeological remains are uncovered or discovered during site preparation activities, all activities in the area of the find would be stopped, and the YPG Cultural Resources Manager will be notified immediately. The YPG Cultural Resources Manager would assess the significance of the discovered resources in accordance with the NRHP evaluation criteria and the resources would be managed in accordance with 36 CFR 800, as appropriate.
- If human remains are encountered, all project activity on or near the discovery site shall cease immediately. The human remains shall be protected from further disturbance, and the Cultural Resources Manager and the Emergency Services Directorate will be notified immediately.

3.4 HEALTH AND SAFETY

The standards applicable to the evaluation of health and safety effects differ for workers and the public. The Occupational Safety and Health Administration is responsible for protecting worker health and safety in non-military workplaces. Regulations that specify and implement safety procedures for Army operations and activities at YPG applicable to the proposed action are:

- Yuma Proving Ground Standing Operating Procedure for Range Operations YP-YTPO-P1000 (September, 2007) prescribes general range control procedures, instructions, and information necessary for safe conduct of all types of test operations, demonstrations, training, and ground and airspace utilization at Yuma Proving Ground.
- Yuma Proving Ground Regulation 385-1 (April, 2007) provides specific guidance for all safety programs at YPG and applies to all personnel working and living at YPG to include military, civilian, contractor, tenant personnel, and dependents.
- Army Regulation (AR) 385-63 (May, 2003) prescribes Army-wide range safety policies and responsibilities for firing ammunition, lasers, guided missiles, and rockets and provides guidance for the application of risk management in range operations.

A number of sites regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and its extension, the Superfund Amendments and Reauthorization Act, and the Resource Conservation and Recovery Act (RCRA) occur on Yuma Proving Ground. Although YPG has conducted Phase I, II, and III site investigations for portions of the

installation, a few of the CERCLA and RCRA sites have not been fully investigated and characterized. The proposed LRM sites are not located on or adjacent to any sites at YPG that are being investigated or undergoing restoration in accordance with CERCLA or RCRA. A number of unexploded ordnance (UXO) sites also are present on the installation. UXO is present on some of the sites; however, standard safety procedures and proper measures are taken when UXO is present.

3.4.1 Environmental Consequences and Mitigation

Preparation, operation, and activities at the proposed LRM sites will not adversely affect the health and safety of YPG personnel or the public and will not result in violation of Federal or State health and safety regulations. To further mitigate any risks to workers or public health and safety the following processes will be taken in association with the proposed action.

- Prior to any ground disturbing activities associated with the proposed project, a dig permit will be obtained, which requires coordination through applicable YPG offices, such as the Environmental Sciences Division and the Garrison Safety Office
- When testing munitions, the proper coordination of range control, the safety office, and YPG personnel will occur.

3.5 LAND USE, RECREATION, AND AIRSPACE

The land base of YPG is dedicated to military testing and evaluation, which requires that most of the land be reserved for firing ranges, impact areas, mobility (vehicle) test courses, drop zones, mine fields, and other test mission related support facilities. Many of these activities and facilities require large open areas with associated safety and buffer areas, as well as restricted airspace.

3.5.1 Installation Land Use

YPG is subdivided into three geographic and functional areas; (1) the Laguna Region, (2) the Cibola Region, and (3) the Kofa Region (see Figure 1). Below is a brief description of each of these regions and the types of activities that typically occur within each.

Cibola Region: This region is mostly the area of YPG located west of U.S. Highway 95 (excluding the Laguna Region). The activities in the Cibola Region are diverse and include testing of aviation weapons and systems, including unmanned aerial systems, air cargo delivery systems, ground combat systems, a variety of mine and countermine activities, including detection and elimination systems for improvised explosive devices, and soldier and tactical weapons training activities. All of the proposed LRM sites are located within this region.

Kofa Region: This region is the area east of Firing Front Road including the East Arm portion of YPG and is primarily used for direct and indirect firing of artillery and other weapons and munitions test activities such as deployed mines, improved conventional munitions, instrumented projectiles, electromagnetic gun, mine and countermine activities, radar/sensor systems, and counter electronic warfare.

Laguna Region: This region is the area where cantonment areas and population centers are primarily located. The cantonment areas in this region include the Main Administrative Area (MAA or Main Post), where most public works functions, Family Morale, Welfare, and Recreation services, and post housing are located; Laguna Army Airfield, where aviation support functions are based; and the YTC (formerly Mobility Test Area and Materiel Test Directorate),

which is the location of Command functions (Garrison and Test) and their associated offices. The Kofa cantonment area adjacent to the KFR is located west of Firing Front Road and east of U.S. Highway 95 and is comprised of administrative offices and operational support functions; therefore, it is also included as part of the Laguna Region.

3.5.2 Recreation

General recreation activities and facilities at YPG are mostly located within or near the Main Administrative Area and include a RV camp, a variety of events and museums available to the public and recreational facilities (gym, pool, stables, etc) for YPG personnel and families.

YPG has a hunting program that accommodates hunting in designated areas on the installation (see figure 6) during established hunting seasons as per the Yuma Proving Ground Hunting Program Rules and Regulations (http://www.yuma.army.mil/hunting_rules.shtml). Current hunting season dates are January 1st through the last day of quail season and from September 1st through December 31st. Access to designated hunting areas on YPG requires a valid license from AGFD and an access permit issued by the YPG Environmental Sciences Division.

3.5.3 Airspace Resources

The majority of airspace associated with YPG is classified as restricted (refer to Figure 2), and all of the LRM sites (proposed and existing) are located within restricted airspace with suitable operational designations (i.e., surface to 80,000 feet).

3.5.4 Surrounding Land Use

Most of the land adjacent to YPG is public lands managed by other federal agencies for specific purposes, such as wildlife refuge or recreation (refer to Figure 1). There are a few discrete areas of private or state land; however, there are no large cities or towns that abut the installation boundary. Most of the land is remote desert landscape with little or no development. The nearest area with development is along the southern portion of the YPG's western boundary and is centered around Martinez Lake and other recreational establishments on the Colorado River.

3.5.5 Environmental Consequences and Mitigation

The proposed LRM sites are located within the Cibola Range and are compatible with existing land use in that region. These sites will not degrade the land to the extent it will prohibit current or planned uses. Two of the proposed gun positions (48KM and Ehrenburg) are in close proximity to the installation boundary; however, activity at these sites will not adversely affect surrounding land use because the SDZs associated with these gun positions do not extend beyond the installation boundary.

Two of the proposed GPs (48KM and Ehrenburg) are on or adjacent to Ehrenburg Road, and one of the proposed impact areas (Trigo) is located approximately 0.28 miles north of Cibola Lake Road. Both roads are generally open to public travel except during infrequent and short-term closures during active tests. Frequency of use at Ehrenburg and 48KM GPs is expected to be less than three times per year (see Table 1).

Project personnel position barriers, signs, and or personnel at ingress and egress points on roads to preclude unauthorized access during test missions. These limitations and restrictions are a standard safety procedure affecting all areas on YPG during test activities, which includes roads and areas available for public use and access. Therefore, no long-term closure of these public access roads will occur, and significant impacts are not anticipated.

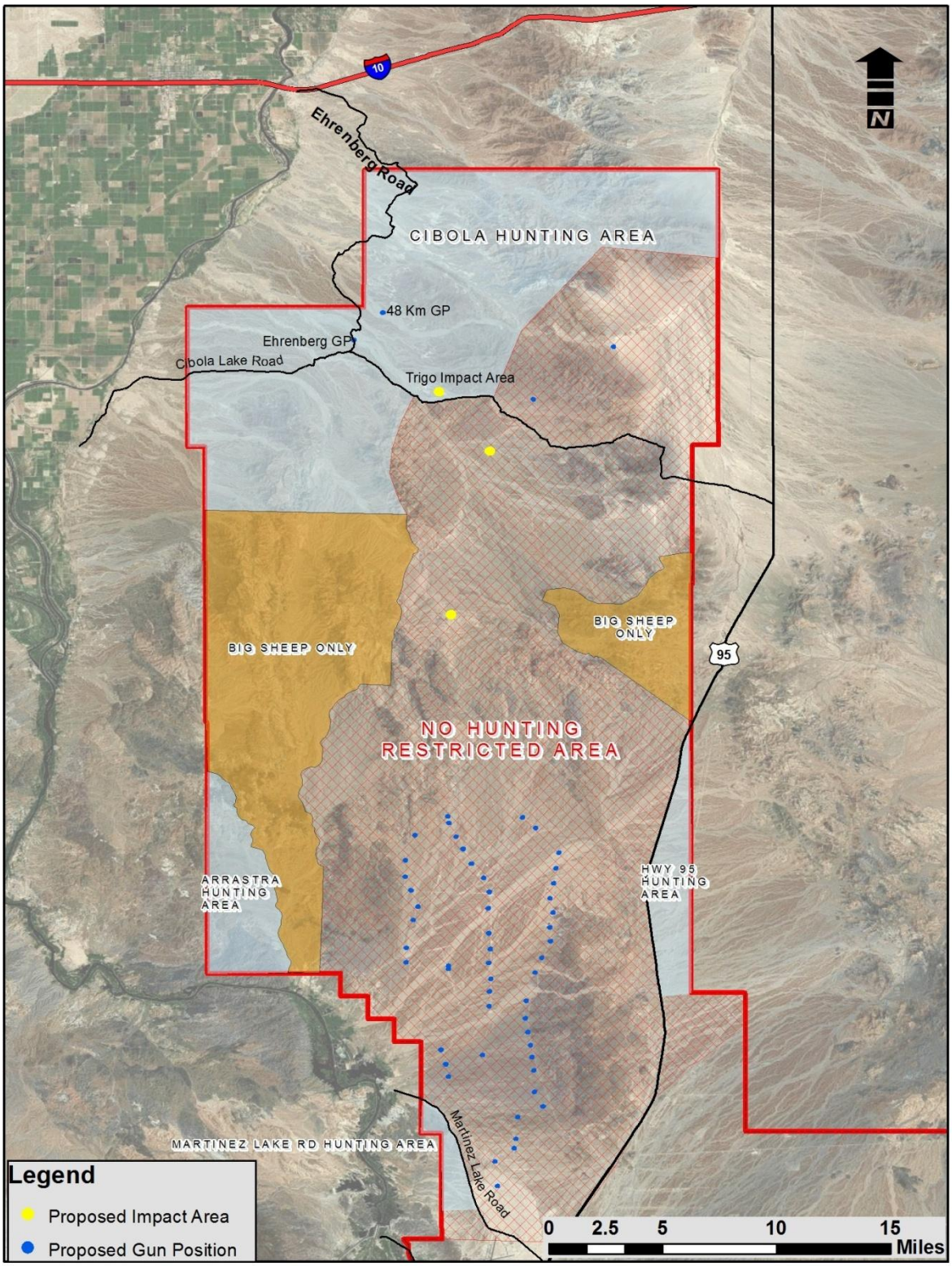

Figure 6. Hunting Areas on Cibola Region

Three of the proposed LRM sites (Ehrenburg GP, 48 KM GP, and the Trigo Impact Area) are located within the designated boundary of YPG's Cibola hunting area; however, hunters and accompanying parties are required to coordinate with YPG Range Control and obtain a range clearance before entering YPG boundaries for recreational hunting activities. Requirements to obtain a YPG Hunting Permit include completion of a range safety briefing and registration of all firearms brought on to the installation. As part of the YPG Hunting Program Hunting Safety (http://www.yuma.army.mil/hunting_safety.shtml), hunters and their accompanying hunting party members are reminded: "occasionally, due to testing, some affected hunting areas may be temporarily closed."

3.6 SOIL RESOURCES

The surface soils of YPG were mapped and described by the Natural Resources Conservation Service (formerly the Soil Conservation Service) and have been classified by the U.S. Department of Agriculture as aridic and hyperthermic with lithic and typic torriorthents on the hills and mountains. Mean soil temperatures are at least 72°F with more than a 9°F difference between summer and winter temperatures (U.S. Army Yuma Proving Ground, 2001). Soil depths at YPG range from very deep in alluvial basins to very shallow in the mountain regions where bedrock is often exposed. The majority of YPG soils were characterized as ranging from extremely gravelly or cobbly sand, to very fine, sandy loam (Soil Conservation Service, 1991).

The Mohave Impact area is located on soils in the Gunsight-Chuckwalla complex, which consists of well-drained fan terrace formations with a five to forty-five percent slope. These soils are very deep with moderate permeability. Approximately half of the Trigo Impact Area is located on soils in the Gunsight-Chuckwalla complex mentioned above, while the other half is on Cristobol-Gunsight complex soils. The large majority of the Tong Peak Impact Area is also located on Cristobol-Gunsight complex. These consist of well-drained crest, summit, or sideslope formations with a one to fifteen percent slope. These soils are very deep with very slow to moderate permeability. A very small portion of the outer boundary of Tong Peak Impact area is located in the Lithic Torriorthents and Typic Torriorthents soil complex. These soils are comprised of excessively drained hills or mountains and have a slope anywhere from fifteen to sixty percent. Table 5 provides a summary description of soil types found at the proposed gun positions.

Table 5. Soil Complexes for Gun Position Soils

Soil Type	Description	Gun Positions [(a)]
Cristobol-Gunsight	Well-drained summit, crest or sideslope with 1 to 15 percent slope; very deep soils with slow to moderate permeability	27.7 KM, 36 KM, 25.4 KM, 36 KM, 37 KM, CB 26K/Wraith, CB 28K, CB 29K, CB 30K, CB 31K, CB 332K, CB 33K, DFR, DFR 2, Ehrenburg, HH 26K, HH 27K, JERC 2, MM 24K, MM 26K, MM 29K, MM 30K, MM 31K, MM 33K, MM 35K, MM 36K, OP CUB, OP GRIZ, RH 21K, RH 22K, RH 24K, RH 25K, Rocket Alley, Rocket Alley 41K, Site 13.25K

Soil Type	Description	Gun Positions [a]
Gilman-Harqua-Glenbar	Well-drained floodplains or basin floors with 0 to 2 percent slope; very deep soils with moderately slow to moderate permeability	JERC 1
Gunsight-Chuckwalla	Well-drained fan terraces with 5 to 45 percent slope; very deep soils with moderate permeability	Chem Test 43K, HH 30K, MM 27K, MM 38K, TB 21K, WTB 21K
Lithic Torriorthents and Typic Torriorthents	Excessively drained hills and mountains with 15 to 60 percent slope; moderate to moderately rapid permeability	19.7 KM, 48 KM
Riverbend-Carrizo	Excessively drained stream terraces with 1 to 3 percent slope; very deep soils with rapid to very rapid permeability	HH 29K, MM 23K, MM 34K, MM 25K, MM 37K, MM 28K, RH 20K, RH 23K, Site 13.25K, T 20K, TB 21K, WTB 24K

[a] Sites with more than one soil type are listed under all applicable soil categories.

3.6.1 Environmental Consequences and Mitigation

Disturbance of soil during site preparation will be limited to the extent practicable and will be contained within the designated project footprint. Significant adverse impacts to soil resources will not occur as a result of the proposed action; however, the following mitigation and management will be implemented during site preparation and operations to avoid or minimize potential impacts to soil resources.

- Disturbance of soil will be kept to the minimum necessary for operational purposes and will be confined to the delineated boundaries for each of the proposed gun positions and impact areas by using existing trails and roads to the extent practicable.
- Erosion control procedures and techniques will be used to avoid or minimize potential for severe erosion to occur.
- Drip pans will be used under construction equipment when not in operation to prevent soil contamination from undetected leaks and under any generators that are used at each site.
- Vehicle and equipment traffic will use designated access roads.
- Any leaks or accidental releases of petroleum products (i.e., fuel or lubricants) will be immediately contained and cleaned up in accordance with an approved site Spill Prevention, Control, and Countermeasures plan (if applicable).

3.7 TRANSPORTATION AND INFRASTRUCTURE

3.7.1 Transportation

Transportation on the installation is accomplished through a network of paved and unpaved roads and a variety of trails and unimproved roads. Most paved roads are concentrated around the cantonment areas with gravel roads, such as Cibola Lake Road, serving as the primary connections to remote areas of the installation. Gravel roads are maintained on a regular basis

and other unimproved roads are maintained (graded and or watered) as needed to provide access to various test and training areas.

Roads open to public access that traverse the installation are limited to U.S. Highway 95, Imperial/Laguna Dam Road, Martinez Lake Road, Cibola Lake Road, and Ehrenberg Road. Roads located at MAA are open to residents, employees, and authorized visitors. Other roads in the Kofa and Cibola regions are closed to the general public except in emergency or on a case-by-case basis.

3.7.2 Utilities and Infrastructure

Infrastructure addresses those facilities and systems that provide power, water, wastewater treatment, and the collection and disposal of solid waste.

Electric Power: Electricity at YPG is obtained from offsite providers with the majority of power being provided by the Western Area Power Administration. Electricity is readily available in the main cantonment areas, such as MAA, YTC, and KFR administrative area. Electrical power in remote areas of the installation is primarily supplied through the use of mobile generators.

Water: YPG obtains its water supply from groundwater wells and water treatment plants located at MAA, YTC, and KFR supply potable water to cantonment areas. Bottled water vendors or bulk trucks supply water (potable and non-potable) at remote locations.

Wastewater and Sanitary Services: Wastewater from developed areas is treated in wastewater lagoons located in the main cantonment areas (MAA, Laguna Army Airfield, YTC, and KFR). Septic systems are used to manage wastewater generated at outlying compounds such as Castle Dome Heliport and Castle Dome Annex. Portable toilets are used in remote areas of the installation and will be used at the LRM gun positions and impact areas as needed.

Solid Waste: YPG operates a permitted non-hazardous waste landfill for the disposal of inert material. Most solid waste generated on the installation is either disposed in the YPG landfill or collected and transported for offsite disposal in permitted landfills in the area.

3.7.3 Environmental Consequences and Mitigation

Travel to and from the installation is not expected to increase substantially under the proposed action. Public access to Ehrenburg Road and Cibola Lake Road during the firing of munitions from the 48KM and Ehrenburg gun positions may be limited or restricted because of the SDZs associated with some munitions. However, the expected use of these gun positions is less than three times per year and will not result in long-term disruption to the these public access roads.

One of the proposed impact areas, Trigo, is located approximately 0.28 miles north of Cibola Lake Road and public access will be limited or restricted during test events. These restrictions are expected to occur at infrequent short periods of time and will not result in long-term disruption of public access to Cibola Lake Road. Due to the distance from this proposed impact area, fragments and debris from test events are not anticipated to land on Cibola Lake Road. In addition, YPG test personnel survey areas surrounding gun positions and impact areas to identify fragments or debris prior to leaving the area and allowing access to recommence (public or YPG restricted).

Additionally, SDZs associated with some of the proposed gun positions and impact areas are such that public access and travel on Cibola Lake Road or Ehrenburg would be subject to short-

term limitations during active LRM test missions. This type of limitation is a standard safety procedure affecting all areas on YPG during test activities, which includes roads and areas available for public use and access. Project directors position barriers, signs, and/or personnel at ingress and egress points on roads to preclude unauthorized access during test missions.

Existing utilities, infrastructure, and associated support will be sufficient to sustain activities at the LRM gun positions and impact areas.

3.8 WATER RESOURCES

YPG is within the Colorado/Lower Gila watershed. The Colorado River is located west of the installation and flows in a north to south direction, while the lower Gila River is south of YPG and flows in an east to west direction.

3.8.1 Surface Water

There are no perennial lakes, streams, or mountain springs within the boundaries of YPG; however, there are numerous ephemeral washes that originate on or cross the installation. Washes within the Kofa Region flow toward the lower Gila River while those within the Cibola Region and Laguna Region primarily flow toward the Colorado River. The major washes that may flow in the general vicinity of the proposed LRM sites include Mohave Wash, Trigo Wash, McAllister Wash, Indian Wash, and Los Angeles Wash. Table 6 below shows proposed LRM sites within approximately one mile of these major washes. These desert washes are dry most of the year, which is characteristic of Sonoran Desert precipitation patterns. Only after significant rainfall events do these washes carry surface drainage towards the Colorado River to the west.

Table 6. Proposed LRM Sites within Approximately One Mile of Major Washes

Major Wash	Gun Positions Within Approximately One Mile of a Major Wash
Mohave Wash	Ehrenburg
Trigo Wash	JERC 1, 48KM
McAllister Wash	19.7 KM, RH 20K, RH 21K, RH 22K, WTB 21K, WTB 23K, WTB 24K, Site 13.25K, HH 26K, HH 27K, HH 29K, HH 30K
Indian Wash	HH 30K, RH 24K, RH 25K, MM 23K, MM 24K, MM 25K, CB 26K/WRAITH, CB 28K, DFR, DFR 2
Los Angeles Wash	36KM, CB 33K, CB 32K, CB 31K, MM 31K, MM 33K, MM 34K

3.8.2 Groundwater

Groundwater on YPG is found in hydrologic basins located below the surface. The Colorado and Gila rivers replenish groundwater for the Yuma region. Depth to groundwater at the installation varies dependent upon geology, location, and thickness of basin alluvium. Known depths to groundwater range from 30 feet (near MAA) to more than 1,000 feet (in north Cibola Region).

3.8.3 Environmental Consequences and Mitigation

While the proposed LRM sites do not necessarily contain these major washes within their boundaries, there are minor channels in or near some of the sites that drain a substantial amount

to the surrounding area. Each of the site footprints and activities will be oriented to avoid these minor channels.

To further avoid or minimize the potential for impacts to surface water resources during use of these sites or any necessary construction, the following mitigation and management practices will be required:

- Appropriate storm water permits will be obtained and a Storm Water Pollution Prevention Plan for construction activities, as appropriate, will be prepared and implemented in accordance with the Arizona Pollutant Discharge Elimination Construction General Permit
- Dredge or fill will not occur in waters of the U.S. prior to compliance with and completion of applicable Clean Water Act (CWA) section 404 permitting requirements

Preparation, operation, and activities at the proposed LRM sites will not require any use of groundwater resources. Use of drip pans under construction equipment and generators will prevent any accidental releases from reaching ground water. Therefore, groundwater quality will not be degraded below CWA standards, and significant impacts to groundwater are not anticipated as a result of the proposed action.

3.9 Irreversible or Irretrievable Commitment of Resources

Section 102(A) (v) of the NEPA requires that environmental analysis include identification of ". . . any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented." Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that are not replaceable within a reasonable period. Preparation, operation, and activities at the proposed gun positions and impact areas would result in minor commitments of such resources as fuel for operation of vehicles and generators, explosives and projectiles in the weaponry, and water for dust suppression. The level of use for these resources is not anticipated to be substantially more than current use.

3.10 Conflicts with Federal, State, or Local Land Use Plans, Policies, and Controls

The proposed action to develop the gun positions and impact areas in the Cibola Region of YPG will not result in a conflict with any known Federal, State, or local land use policies and controls. Further, the proposed action is consistent with YPG's designated land use as a military installation. All site preparation, operation, and activities will comply with applicable environmental laws and regulations and the YPG Environmental Sciences Division will oversee or initiate any environmental permitting requirements prior to project activities.

3.11 Cumulative Effects

Cumulative impacts on environmental resources result from incremental impacts of an action, when combined with other past, present, and reasonably foreseeable future projects in the area. Cumulative effects may arise from single or multiple actions and may result in additive or interactive effects (CEQ 1997). Cumulative impacts can result from minor, but collectively substantial actions undertaken over a period of time by various agencies (Federal, State, and local) or individuals (40 CFR 1508.7).

Council on Environmental Quality (CEQ) guidelines state that cumulative effects analyses should be limited to effects that can be evaluated meaningfully by decision-makers. These guidelines further state that the area to use in defining the cumulative impacts geographical boundary should extend to the point at which the resource is no longer affected significantly (CEQ 1997).

Analysis of cultural and natural resources at the proposed sites was performed to determine the need for project specific precautions regarding management of environmental resources. The resulting data were used to evaluate potential direct, indirect, and cumulative impacts, and to plan for mitigation and monitoring as required. Several projects currently occur in the Cibola Region; however, no projects are within the project analysis area. These projects and working areas include automotive testing, ground combat systems testing, drop zones, sensor testing, and impact areas. During testing of ground combat systems, effectiveness and accuracy of everything from small arms to long range munitions are evaluated; however, the majority of ground combat systems testing occurs in the Kofa Region. Automotive testing occurs on marked courses and will not interfere or overlap with proposed LRM gun positions or impact areas. Twenty-one additional impact areas were designated in the Cibola Region (YPG, 2011) to support increased workloads. Military testing and training exercises occur at two Joint Experimental Range Complexes (JERC) in the Cibola Region. These sites were established to simulate conditions in current war zones. EAs were completed for these activities and no significant effects with the potential to contribute to cumulative effects were identified.

Other mission activities currently occur in the project vicinity; however, they are consistent with existing land use at YPG and are managed in accordance with applicable YPG management documents as well as Federal and state laws and regulations.

Multiple solar projects are expected to occur in the area in the reasonably foreseeable future. A proposal currently exists for construction of renewable energy infrastructure facilities in the northeast Cibola Region and NEPA analysis is currently under way for this project. BLM is also considering applications for solar projects on land to the northeast side of the Cibola Region. NEPA analyses would be conducted for these projects, including cumulative effects analysis, before any construction would occur.

Significant cumulative impacts to the natural and human environment on a regional scale are not anticipated to occur as a result of implementing the proposed action. By maintaining mission objectives while ensuring compliance with environmental regulations, YPG demonstrates its commitment to sound stewardship of public land. To support this role YPG maintains several environmental plans and programs designed to assist with monitoring and maintaining its natural environmental resources including the Land Condition-Trend Analysis, the Integrated Training Area Management, and the Integrated Natural Resources Management Plan. These programs provide scientific and management information for the monitoring of natural resources at YPG, with specific emphasis on lands where training and test activities occur. These programs will help to ensure that any adverse impacts are identified, mitigated where possible, and monitored.

4.0 FINDINGS AND CONCLUSIONS

Valued Environmental Components at YPG and in the region were evaluated against the activities and actions associated with adding LRM gun positions and impact areas in the Cibola Region. Based on the evaluation in this EA it was determined that impacts to soils, water, biological resources, cultural resources, air quality, land use, health and safety, noise, and transportation, utilities, and infrastructure could result from implementation of the proposed action. The potential for adverse impacts will be minimized by implementation of mitigation measures and BMPs described in Chapter 3. All aspects of the proposed action will follow applicable plans, policies, and procedures and standard BMPs will be implemented to reduce or prevent undesirable effects resulting from project implementation. Effects to socioeconomic values, environmental justice, visual and aesthetics, wild and scenic rivers, coastal zone management, floodplains, geology and geography, hazardous and toxic substances, meteorological conditions (climate), and prime farmlands were analyzed in section 3.0 and were eliminated from further consideration in this evaluation because impacts to those resources would not occur or would be negligible. The discussion in section 3.0 presented the rationale for why these resources were eliminated from further detailed analysis. This approach allowed the analysis of potential impacts to focus on those resources that would potentially be impacted by the proposed action.

Based on the analysis presented in this EA, implementation of the *Alternative A – LRM Gun Positions and Impacts Areas in Cibola Region* – including all applicable mitigation measures, did not reveal the potential for significant environmental effects. Therefore, preparation of an Environmental Impact Statement is not required, and a Finding of No Significant Impact (FNSI) is recommended.

5.0 COORDINATION AND PREPARATION

YPG sent scoping letters to the entities listed below on January 10, 2013. A Notice of Availability for the EA and draft FNSI was published on February 24, 2013 and copies of the EA and draft FNSI were be sent to stakeholders who requested a copy during scoping. The EA and draft FNSI were available by request to the YPG NEPA coordinator at 301 C Street, IMYM-PWE, Yuma, AZ or via email to usarmy.ypg.imcom.mbx.nepa@mail.mil. In addition, the EA was posted on the YPG Website at www.yuma.army.mil/mhub_documents.shtml. The EA comment period ended on March 27, 2013. YPG assessed all comments received and modified into the EA, as appropriate.

Federal Agencies
Bureau of Indian Affairs, Western Regional Office
Bureau of Land Management, Yuma Field Office
Bureau of Reclamation, Yuma Area Office
Marine Corp Air Station Yuma, Environmental Department
U.S. Customs and Border Protection, Border Patrol, Yuma Sector
U.S. Fish and Wildlife Service, Arizona Ecological Services Field Office
U.S. Fish and Wildlife Service, Cibola National Wildlife Refuge
U.S. Fish and Wildlife Service, Imperial National Wildlife Refuge
U.S. Fish and Wildlife Service, Kofa National Wildlife Refuge
U.S. Fish and Wildlife Service, Southwest Arizona National Wildlife Refuge Complex
USDA Natural Resources Conservation Service, Yuma Service Center

Native American Tribes
Ak-Chin Indian Community
Chemehuevi Indian Tribe
Cocopah Indian Tribe
Colorado River Indian Tribes
Fort McDowell Yavapai Nation
Fort Mojave Indian Tribe
Gila River Indian Community
Hopi Tribe
Quechan Indian Tribe
Salt River Pima-Maricopa Indian Community
San Carlos Apache Tribe
Tohono O'odham Nation
Yavapai-Apache Nation
Yavapai-Prescott Tribe

Local Agencies
Yuma Chamber of Commerce, Military Affairs Committee
City of Yuma, Community Development
La Paz County, Community Development
Yuma County, Development Services

Private Entities
Arizona Deer Association
Arizona Desert Bighorn Sheep Society
Arizona Historical Society
Arizona Wilderness Coalition
Audubon Society
Center for Biological Diversity
Sierra Club
Yuma Valley Rod and Gun Club

State Agencies
Arizona Department of Agriculture, Native Plant Program
Arizona Department of Environmental Quality, Administrative Counsel
Arizona Department of Environmental Quality, Air Quality Planning Section
Arizona Department of Environmental Quality, Federal Project Unit
Arizona Game and Fish Department, Project Evaluation Program
Arizona Game and Fish Department, Yuma Habitat Program Manager

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The following interdisciplinary team participated in the analysis of the proposed action and preparation of this EA or contributed information critical to the evaluation.

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APPENDIX A
Biological Review and Evaluation of LRM Gun Positions and Impact Areas

Each proposed gun position (GP) and impact area for use in the LRM was visited in November and December of 2012 to evaluate the vegetative communities and wildlife or habitat functions for each location. No native or non-native wildlife was observed during the site surveys, however mule deer were observed in route to locations, along Middle Mountain Road and Cibola Front Road. Habitat characteristics are generally lacking at the proposed locations due to the relatively flat topography, existing disturbance and limited vegetation at each of the sites.

Vegetation observed during the site visits is described below for each site and a photo showing the site condition is provided. Ephemeral wash channels are located adjacent or near to each of the sites; however, these washes are generally very small with minimal vegetation that is widely spaced and would not be heavily used as migratory corridors by wildlife species resident on the installation.

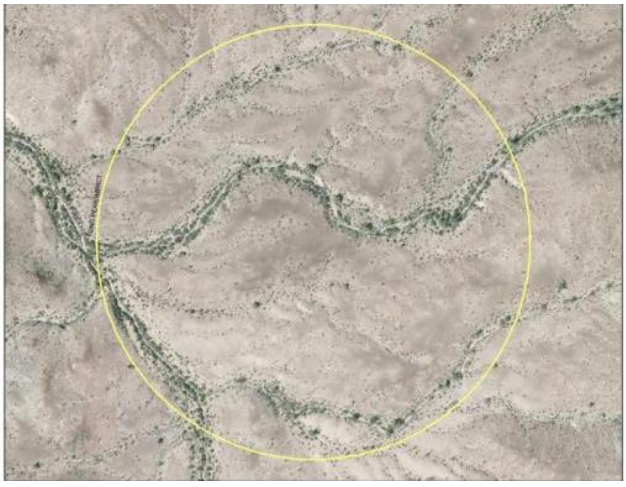
Trigo Impact Area

This site exhibits plant species found mostly in the Creosotebush-White Bursage Association in the nearby surrounding area. The area is comprised mainly of undisturbed desert pavement. Few saguaros are present. The southern section of the impact area is comprised of a small rocky hill containing few creosote plants.

Site overview at Proposed Trigo Impact Area

Tong Peak Impact Area

Vegetation type for this site is the typical Creosotebush-White Bursage Association. The area exists on previously undisturbed desert pavement. Surrounding vegetation along minor washes includes ocotillo, cholla, paloverde, ironwood and saguaro cacti.



Site overview at Proposed Tong Peak Impact Area

Mohave Impact Area

This proposed site lies at the intersection of two commonly used Cibola Range roads. Vegetation in the surrounding area is Cresotebush-White Bursage Association. Vegetation is sparse and is restricted to two ephemeral washes and consists of creosote, ironwood and paloverde. The proposed impact area is comprised of moderately disturbed desert pavement.

Site overview at Proposed Mohave Impact Area

HH 26K GP

The area surrounding HH 26K is typical Cresotebush-White Bursage Association with scattered paloverde spp. and ironwood existing in a moderately sized wash east of the center point. The area lies east of a heavily used road on previously disturbed desert pavement.

Site overview at Proposed HH 26K GP

HH 27K GP

This site exhibits plants generally found in the Creosotebush-White Bursage Association. A small ephemeral wash runs north-south and is habitat to few paloverde and ironwood trees. The site exists on moderately disturbed desert pavement from vehicle traffic.

Site overview at Proposed HH 27K GP

HH 29K GP

The proposed GP is located in a large series of braided washes stemming from a larger wash. The area is previously disturbed, as a major road runs adjacent to the proposed GP. Vegetation is sparse and consists of mainly creosote and scattered ironwood trees.

Site overview at Proposed HH 29K GP

HH 30K GP

This site associates with the Cresotebush-White Bursage Association, with creosote being the dominant species in the area. Previous vehicular disturbance is present in the area. Other notable species in the area include paloverde and ironwood trees in a small ephemeral wash west of the center stake.

Site overview at Proposed HH 30K GP

MM 23K GP

This site is located in a large braided wash system east of an existing Cibola Range road. Vegetation associates with Creosotebush-White Bursage Association with scattered paloverde and ironwood trees. Few saguaros exist in the area, some exhibiting cavities created by wildlife.

Site overview at Proposed MM 23K GP

MM 24K GP

The proposed GP site exists on heavily disturbed desert pavement between two heavily used Cibola Range roads. Vegetation is void within the proposed area and surrounding vegetation is typical Creosotebush-White Bursage community.

Site overview at Proposed MM 24K GP

MM 25K GP

This site is located in a large braided wash system west of an existing Cibola Range road. Vegetation is typical Creosotebush-White Bursage association with scattered paloverde and ironwood trees.

Site overview at Proposed MM 25K GP

MM 26K GP

Vegetation for this site is sparse and is restricted to two small ephemeral washes running east-west through the site. Vegetation is typical Creosotebush-White Bursage association with scattered paloverde and ironwood trees.

Site overview at Proposed MM26K GP

MM 27K GP

The site land form is moderately disturbed desert pavement. Vegetation for this site is sparse and typical Creosotebush-White Bursage association with scattered ironwood and paloverde trees that are restricted to a small ephemeral wash that runs through the south of the area.

Site overview at Proposed MM 27K GP

MM 28K GP

This site lies south of an existing facility on moderately disturbed desert pavement. Vegetation within the area and surrounding area is Creosotebush-White Bursage association with few scattered paloverde trees along a small ephemeral wash on the southern half of the proposed area.

Site overview at Proposed MM 28K GP

MM 29K GP

The site landform is moderately disturbed desert pavement with sparse vegetation. Vegetation in the surrounding area exhibits the Creosote-White Bursage association. There is a moderate size wash south of the proposed area with one saguaro and few paloverde and ironwood trees.

Site overview at Proposed MM 29K GP

MM 30K GP

The site landform is heavily disturbed desert pavement with very sparse vegetation except few perennial grasses growing along the disturbed areas. Surrounding vegetation exhibits the Creosotebush-White Bursage association.

Site overview at Proposed MM 30K GP

MM 31K GP

The site lies north of a moderately sized ephemeral wash on previously disturbed desert pavement. Vegetation within the area is sparse and surrounding vegetation outside the proposed area exhibits the Cresotebush-White Bursage association.

Site overview at Proposed MM 31K GP

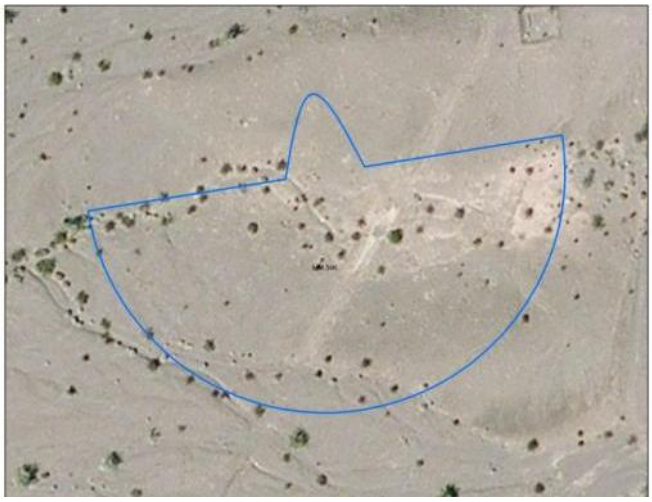
MM 33K GP

The site landform is moderately disturbed desert pavement with numerous vehicle tracks. Vegetation for the area is sparse and restricted to a small ephemeral wash on the southwest corner of the proposed area. Vegetation consists of creosote, white bursage and brittle bush.

Site overview at Proposed MM 33K GP

MM 34K GP

The site lies in a large braided wash system. Vegetation exhibits characteristics of the Creosotebush-White Bursage association with scattered paloverde and ironwood trees along the banks of the wash system. The site lies northwest of two frequently used Cibola Range roads, in a previously disturbed area.



Site overview at Proposed MM 34K GP

MM 35K GP

The site exists in an area with heavily disturbed desert pavement that is void of vegetation with the exception of few perennial grasses growing along the disturbance.

Site overview at Proposed MM 35K GP

MM 36K GP

The site lies west of a heavily used Cibola Range road in an area with moderately disturbed desert pavement. Vegetation is restricted to small ephemeral washes and consists of creosote and bursage.

Site overview at Proposed MM 36K GP

MM 37K GP

The site lies west of a heavily used Cibola Range road along previously disturbed desert pavement. Two saguaros exist within the proposed boundary. Vegetation associates with Creosotebush-White Bursage association and also includes ironwood and paloverde trees.

Site overview at Proposed MM 37K GP

MM 38K GP

The site landform is moderately disturbed desert pavement and is sparsely vegetated. Vegetation for the area is primarily restricted to a series of small ephemeral washes running east to west along the proposed area. Vegetation mainly consists of creosote and small ironwood and paloverde trees.

Site overview at Proposed MM 38K GP

RH 20K GP

The site is located in a large drainage bottom with sparse vegetation. Vegetation for the area consists of creosote, beaver-tail cactus (*Opuntia basilaris*) and six moderately sized paloverde trees. Previous disturbance is mild and consists of vehicular traffic.

Site overview at Proposed RH 20K GP

RH 21K GP

The proposed site lies on slightly disturbed desert pavement with very sparse vegetation. Previous disturbance includes munitions from previous tests. Vegetation consists of creosote and small white bursage.

Site overview at Proposed RH 21K GP

RH 23K GP:

The site lies in a drainage plain with sandy/ gravel substrate. Vegetation in the immediate area is sparse but consists of primarily creosote and small white bursage. Previous disturbance is heavy and consists of vehicular traffic.

Site overview at Proposed RH 23K GP

RH 24K GP

The site landform moderately disturbed desert pavement. A wash lies west of the proposed area that contains paloverde and ironwood trees. Vegetation on the proposed site is sparse and consists of Creosotebush-White Bursage association.

Site overview at Proposed RH 24K GP

RH 25K GP

The site landform is heavily disturbed desert pavement, void of vegetation. Primary disturbance is vehicular traffic. Other buildings and structures within the vicinity, but not in the immediate area. A wash lies to the north of the proposed area, but will not be impacted by GP layout.

Site overview at Proposed RH 25K GP

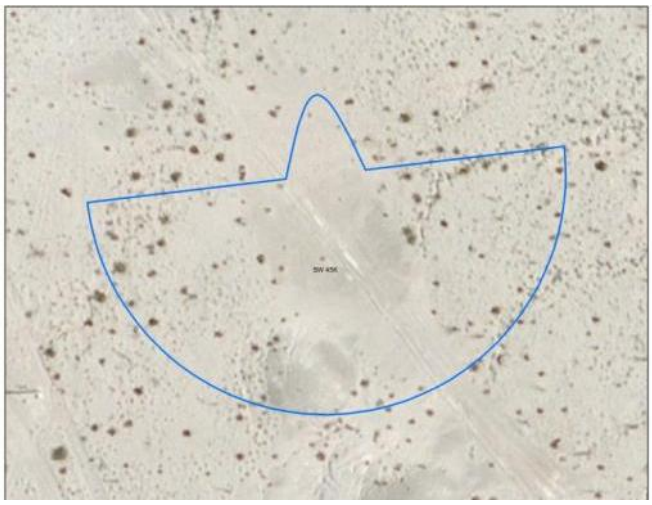
SW 44K GP

This site exists on a slight hill with windblown sand as the main substrate. Vegetation consists primarily of creosote, white bursage, big galleta grass and ocotillo. The site location lies south of a heavily used Cibola Range road.

Site overview at Proposed SW 44K GP

SW 45K GP

This site location exhibits the same characteristics of SW 44K GP. The substrate is windblown sand and the dominant vegetation species is creosote. The site has previous disturbance and two facilities lie within 500 meters of the proposed GP.



Site overview at Proposed SW 45K GP

TB 20K GP

The landform setting for this site consists of moderately disturbed desert pavement. The primary disturbance is vehicular traffic and installation of fiber optics cable. Vegetation in the area is consistent with the Creosotebush-White Bursage association. There is a large wash on the west side of the proposed area with large paloverde and ironwood trees.

Site overview at Proposed TB 20K GP

TB 21K GP

The site landform is moderately disturbed desert pavement. Vegetation consists of primarily creosote scattered across the desert pavement and bursage and brittle bush along the disturbance from the main road that lies northeast of the proposed site. A small wash along the western portion of the site and a large wash along the eastern portion of the site harbor large paloverde and ironwood trees.

Site overview at Proposed TB 21K GP

WTB 21K GP

The sight rests on a slight hill west of a heavily used Cibola Range road. Primarily rests on moderately disturbed desert pavement with moderate size boulders protruding from the ground. Vegetation consists of primarily creosote, beaver tail cactus, teddybear cholla and ocotillo.

Site overview at Proposed WTB 21K GP

WTB 23K GP

This site landform is heavily disturbed desert pavement. Vegetation is sparse, with very few creosote present. Heavily used vehicular tracks scar the desert pavement. One large wash exists east of the proposed location with few large paloverde trees.

Site overview at Proposed WTB 23K GP

WTB 24K GP

This site is located in a large series of braided washes. Soil composition is typical for wash bottoms, consisting of fine gravel and sand. Vegetation consists primarily of creosote and white bursage. Large paloverde and ironwood trees are present in the proposed area.

Site overview at Proposed WTB 24K GP

JERC1 GP

The site landform is heavily disturbed desert pavement. Vegetation is typical Creosotebush-White Bursage association. A small ephemeral wash runs near the site and contains creosote and brittle bush.

Site overview at Proposed JERC1 GP

JERC2 GP

The site landform is heavily disturbed desert pavement. Primary disturbance is vehicular tracks. Vegetation is scarce. A small wash runs through the southeastern portion of the site and contains large paloverde and ironwood trees.

Site overview at Proposed JERC2 GP

CB 26K/ WRAITH GP

The site landform is heavily disturbed desert pavement. Vegetation is void from the proposed area.

Site overview at Proposed CB 26K GP

CB 28K GP

This site landform is moderately disturbed desert pavement with sparse vegetation. Vegetation consists of creosote and bursage primarily, and few paloverde and ironwood trees in a wash east of the proposed GP. The primary disturbance is vehicular traffic.

Site overview at Proposed CB 28K GP

CB 29K GP

This site landform is heavily disturbed desert pavement with sparse vegetation. The primary species of vegetation is creosote. A large wash on the eastern portion of the proposed site contains large paloverde and ironwood trees.

Site overview at Proposed CB 29K GP

CB 30K GP

The site landform is moderately disturbed desert pavement with sparse vegetation. Existing vegetation is consistent with the Creosotebush-White Bursage association. A large wash runs east of the proposed site and contains large paloverde and ironwood trees, creating a dense thicket. Expended ammunition shells litter the area.

Site overview at Proposed CB 30K GP

CB 31K GP

This site exhibits heavy disturbance and rests in a large drainage area. Vegetation is primarily creosote with many large paloverde and ironwood trees within a forty meter radius from the center point of the proposed GP. There is a large borrow pit fifteen meters south of the center point. Vehicle traffic is the primary disturbance.

Site overview at Proposed CB 31K GP

CB 32K GP

The site landform is desert pavement with little disturbance. Two washes run on either side of the proposed GP (east and west) and contain large ironwood and paloverde trees. Vegetation is sparse across the desert pavement, with very few creosote.

Site overview at Proposed CB 32K GP

CB 33K GP

The site landform is moderately disturbed desert pavement with sparse vegetation. Vegetation is consistent with Creosotebush-White Bursage association. Washes are present on either side of the proposed GP (east and west) with large paloverde and ironwood trees present.

Site overview at Proposed CB 33K GP

Chem Test 43K GP

This landform is moderately disturbed desert pavement and braided wash system. Vegetation is consistent with Creosotebush-White Bursage association.

Site overview at Proposed Chem Test 43K GP

Rocket Alley 41K GP

The site landform is slightly disturbed desert pavement. Vegetation in the area is sparse and contains mainly creosote. A wash runs south of the center point for the proposed GP that contains four large saguaros that are unlikely to be impacted.

Site overview at Proposed Rocket Alley 41K GP

Site 13 25K GP

The site landform is heavily disturbed desert pavement north of a heavily used Cibola Range road. Vegetation is sparse and consists of primarily species associated with Creosotebush-White Bursage association. A large wash on the eastern end of the proposed GP contains large paloverde and ironwood trees.

Site overview at Proposed Site 13 25K GP

Rocket Alley GP

This site rests within an existing YPG facility.

Site overview at Proposed Rocket Alley GP

48 KM GP

The site landform is desert pavement with little disturbance. Vegetation is sparse, with creosote being the dominant species. West of the proposed GP is a large wash that supports large paloverde and ironwood trees.

Site overview at Proposed 48 KM GP

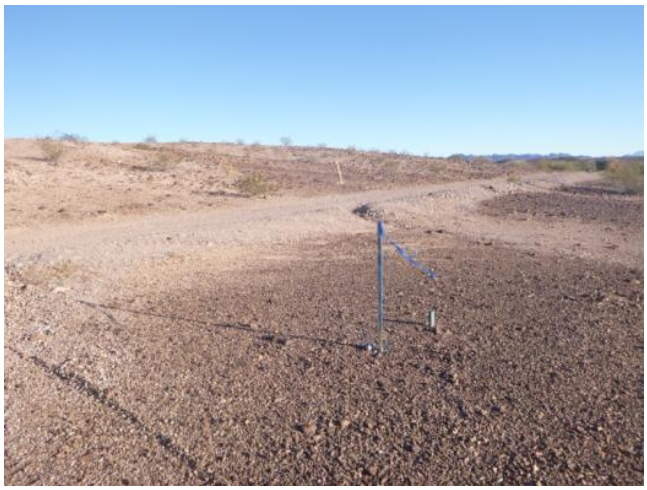
Ehrenburg GP

This site is located on and immediately east of Ehrenburg road, a public access road. The site rests on slightly disturbed desert pavement. Vegetation is restricted to the disturbed area along Ehrenburg road and consists of brittle bush and creosote.

Site overview at Proposed Ehrenburg GP

19.7 KM GP

The site landform is highly disturbed desert pavement. Vegetation is sparse and consists, primarily, of creosote. A wash runs east of the site and contains large paloverde and ironwood trees with dense canopy cover. The wash will not be impacted.



Site overview at Proposed 19.7 KM GP

DFR GP

The site landform is heavily disturbed desert pavement that is littered with ordnance and other debris. Vegetation is sparse and consists mainly of creosote and two small paloverde trees.

Site overview at Proposed DFR GP

DFR 2 GP

This site landform is heavily disturbed desert pavement and is littered with ordnance. Vegetation is sparse and consists of species associated with Creosote-White bursage association. A large wash running on the southeast boundary of the site contains many large paloverde and ironwood trees with dense canopy cover.

Site overview at Proposed DFR 2 GP

36 KM GP

The site landform is moderately disturbed desert pavement. The primary disturbance is vehicular tracks. Vegetation is sparse and consists of creosote and bursage. There is a small ephemeral wash running through the center of the proposed GP that contains most of the vegetation. A large wash runs along the southern end of the proposed GP that contains moderate sized ironwood and paloverde trees.

Site overview at Proposed 36 KM GP

36 KM & 25.4 KM GP

The site landform is heavily disturbed desert pavement that is littered with ordnance. Vegetation is sparse and consists of small creosote and bursage. A small ephemeral wash runs on the western side of the proposed GP and contains most of the vegetation. A large wash runs just north of the proposed GP and contains ironwood and paloverde trees.

Site overview at Proposed 36 KM & 25.4 KM GP

37 KM GP

The site landform is heavily disturbed desert pavement. Vegetation is consistent with Creosotebush-White Bursage association. A small ephemeral wash runs through the center of the proposed GP and contains a large majority of the site's vegetation. A large wash runs approximately eighty meters west of the center point and contains large ironwood and paloverde trees.

Site overview at Proposed 37 KM GP

27.7 KM GP

The site landform is moderately disturbed desert pavement. Vegetation consists of primarily creosote and bursage. Two washes run on either side of the proposed GP and contain ironwood and paloverde trees of moderate size.

Site overview at Proposed 27.7 KM GP

OP CUB GP

The site landform is moderately disturbed desert pavement. Vegetation is sparse and consists primarily of creosote and bursage and is restricted to a small ephemeral wash that runs from the center of the proposed GP. Previous disturbance in the area is primarily vehicular traffic.

Site overview at Proposed OP CUB GP

OP GRIZ GP

The site landform is moderately disturbed desert pavement. The site is located between two heavily used Cibola Range roads. Vegetation is sparse and consists of mainly creosote and bursage. Most of the vegetation is restricted to two small ephemeral washes.

Site overview at Proposed OP GRIZ GP

APPENDIX B COMMENTS RECEIVED

THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT
5000 W. CAREFREE HIGHWAY
PHOENIX, AZ 85086-5000
(602) 942-3000 • WWW.AZGFD.GOV
REGION IV, 9140 E. 28TH ST., YUMA, AZ 85365

GOVERNOR
JANICE K. BREWER
COMMISSIONERS
CHAIRMAN, JACK F. HUSTED, SPRINGERVILLE
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ROBERT E. MANSELL, WINSLOW
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NORMAN W. FREEMAN, CHINO VALLEY
DIRECTOR
LARRY D. VOYLES
DEPUTY DIRECTORS
GARY R. HOVATTER
BOB BROSCHEID

March 18, 2013

YPG NEPA Coordinator
U.S. Army Garrison Yuma
301 C Street
IMYM-PWE
Yuma, Arizona 85365

Re: Environmental Assessment Long Range Munitions

To Whom It May Concern:

The Arizona Game and Fish Department (Department) has reviewed the February 2013 United States Army Garrison Yuma Proving Ground (YPG) Environmental Assessment for the proposed establishment of additional gun positions and impact areas that will accommodate the extended range and Surface Danger Zones associated with Long Range Munitions test activities. Given the description and our understanding of planned activities, we are providing the following comments for your consideration.

Project Description

As we understand from the project description, the purpose of the proposed action is establish additional gun positions and impact areas that will accommodate the extended range and Surface Danger Zones associated with Long Range Munitions test activities.

Department Recommendations

While performing a search on the Department's Heritage Data Management System (HDMS), the bald eagle (*Haliaeetus leucocephalus*), California leaf-nosed bat (*Macrotus californicus*), Mohave fringe-toed lizard (*Uma scoparia*), and the Sonoran desert tortoise (*Gopherus agassizii*) are listed as potentially occurring within or near the proposed project location. The Department's Region IV personnel has indicated the western burrowing owl (*Athene cunicularia hypugaea*) and Le Conte's Thrasher (*Toxostoma lecontei*) may be present within or near the project location. Below is the federal and state status of those species.

Species	FWS	USFS	BLM	State
Bald Eagle	SC, BGA	S	S	WSC
Burrowing Owl	SC	S	S	
California leaf-nosed Bat	SC	S	S	WSC
Mohave fringe-toed lizard			S	WSC
Le Conte's Thrasher				WSC
Sonoran desert tortoise	C	S		WSC

BGA: Bald and Golden Eagle Protection Act
C: Candidate
S: Sensitive
SC: Species of Concern
WSC: Wildlife of Special Concern

The burrowing owl is protected by the Migratory Bird Treaty Act and any take requires the issuance of permits from the U.S. FWS. If any tortoises or owls are encountered prior to testing and construction activities, they should be moved outside the project area within 1 mile of its original location. A scientific collecting permit is required for this activity and should be coordinated with the Region IV Department office. A permit can be obtained by emailing Scpermit@azgfd.gov for more information. For more information on tortoises and wildlife friendly guidelines please visit http://www.azgfd.gov/hgis/guidelines.aspx.

Thank you for the opportunity to provide comments on this project. If you have any questions, please contact me at 928-341-4069 or tbommarito@azgfd.gov.

Sincerely,

Tab Bommarito
Habitat Specialist
Region IV, Yuma

cc: Pat Barber, Regional Supervisor, Region IV
Bill Knowles, Habitat Program Manager, Region IV
Laura Canaca, PEP Supervisor, Habitat Branch
Leonard Ordway, Assistant Director, Field Operations

AGFD # M13-03060241

SIERRA CLUB
FOUNDED 1892

Grand Canyon Chapter ● 202 E. McDowell Rd, Ste 277 ● Phoenix, AZ 85004
Phone: (602) 253-8633 Fax: (602) 258-6533 Email: grand.canyon.chapter@sierraclub.org

March 23, 2013

U.S. Army Garrison Yuma Proving Ground
301 C Street, IMYM-PWE
Yuma, AZ 85365-9498
Emailed to usarmy.ypg.imcom.mbx.nepa@mail.mil

Dear YPG NEPA Coordinator:

Thank you for the opportunity to provide comments on the proposed installation of Long Range Munitions (LRM) testing sites at the Yuma Proving Grounds. Please accept these comments on behalf of the Sierra Club's Grand Canyon Chapter and our 12,000 members and 30,000 members and supporters in Arizona.

The Sierra Club's mission is "to explore, enjoy, and protect the wild places of the earth; to practice and promote the responsible use of the earth's ecosystems and resources; and to educate and enlist humanity to protect and restore the quality of the natural and human environments." Our members have significant interest in this project and have worked to protect natural and cultural resources in these areas. The Grand Canyon Chapter works to protect Arizona's public lands, wildlife, air, and water and is very interested and involved in protecting our valuable natural heritage.

We applaud the YPG in its efforts to minimize environmental impact in the installation of new LRM testing sites, especially with regards to locating said sites in such a way that the existing boundaries of the YPG are not expanded into the nearby Kofa wildlife preserve (11). Though this consideration is important, very real concerns still exist with the project as currently proposed.

Endangered or threatened fauna have been found across the YPG's range [see table 4] including in areas earmarked for LRM installation. While the take of animal species is expected to be low, nesting and breeding sites can be disturbed by both the construction and use of LRM emplacements The Sierra Club recommends exploring low-impact sites for threatened species with regards to both permanent and temporary gun emplacements as to minimize impact on native populations.

One particular species of concerns in the Kofa/YPG region is the Sonoran pronghorn. Individuals from an experimental breeding population may be killed by LRM activities in the Kofa. Though the affected pronghorn population is considered non-essential and experimental, LRM activities are potentially directly detrimental to the population's long term success and establishment. Careful consideration should be given to both bedding and foraging sites of this pronghorn population so that LRM installation does not jeopardize the future of the Sonoran Pronghorn.

Finally, direct damage to the YPG/Kofa landscape as a result of LRM test firing is a major concern. Though site specific analysis would have to be undertaken, many of the proposed battery sites are located on or near natural washes. Disruptions of natural topography due to leveling LRM sites and particularly

in the LRM impact zones could cause serious diversions of waterways that would not be immediately apparent thanks to Arizona's arid climate and general lack of rainfall.

Thank you again for the opportunity to provide comments. Please contact us with any questions about these comments and keep us informed on plans for this area.

Sincerely,

Sandy Bahr
Chapter Director
Sierra Club – Grand Canyon Chapter
sandy.bahr@sierraclub.org

CC: YPG Natural Resources Program Manager, laura.d.merrill4.civ@mail.mil

From:	USARMY YPG IMCOM Mailbox NEPA
To:	Maloney, Kimberly I CTR (US); Polacek, Steven T CIV (US)
Cc:	Glover, John A CIV (US); Steward, Daniel M CIV (US)
Subject:	FW: Comments/Request for additional information re: LRM EA (UNCLASSIFIED)
Date:	Wednesday, March 27, 2013 2:32:24 PM
Attachments:	Gun positions.pdf

Classification: UNCLASSIFIED
Caveats: NONE

Comments from Imperial Refuge Manger...

-----Original Message-----
From: Caswell, Nate [mailto:nate_caswell@fws.gov]
Sent: Wednesday, March 27, 2013 2:17 PM
To: USARMY YPG IMCOM Mailbox NEPA
Subject: Comments/Request for additional information re: LRM EA

YPG NEPA Coordinator,

Thank you for the opportunity to comment on the Long Range Munitions EA provided by Yuma Proving Ground. Given the information provided, Imperial NWR's concerns lie primarily with potential increases in noise and vehicular access traffic for the proposed gun positions closest to the refuge boundary.

The EA states that:
"A noise study and management plan was commissioned by YPG to determine the extent, if any, that operational noise was traveling beyond the installation boundaries. Results of the study show that noise generated within the Cibola Region does not extend beyond the installation boundary (USAPHC, 2011); therefore, potential noise impacts were eliminated from further analysis."

The cited study was not entirely accurate. We are frequently able to hear firing and impacts (presumably various types) from our headquarters area. None of the noise to date has been particularly intrusive. However, future noise levels will obviously depend on types of ordnance fired from these positions and their frequency of use. This is a concern given that several of the proposed locations are closer than existing gun positions.

The information given in the EA does not allow the reader to match up the proposed gun positions on the map with the corresponding information in Table 1 or Appendix A. In addition, frequency of use (times per year) options listed in Table 1 for each proposed gun position are <3, 4, or >5. While the first two are self-explanatory, the last one could mean 6 or it could mean 100.

Please provide additional information on how the proposed gun positions near the Imperial NWR boundary (circled on attached map) will be used, their actual coordinates, access routes, and more specific information corresponding to the site names and characteristics.

Again, thank you for the opportunity to review this EA. My contact information is below if you have any questions.

Sincerely,
Nate Caswell

--

Nate Caswell
Refuge Manager
Imperial NWR
P.O. Box 72217
12812 N Wildlife Way
Yuma, AZ 85365
Phone: (928) 783-3371 ext. 13
Fax: (928) 783-0652
Nate_Caswell@fws.gov

Classification: UNCLASSIFIED
Caveats: NONE

Finding of No Significant Impact

TITLE OF ACTION: *Environmental Assessment for Long Range Munitions; U.S. Army Garrison Yuma Proving Ground.*

BACKGROUND: The U.S. Army Garrison Yuma Proving Ground (Garrison) prepared an environmental assessment (EA) to identify and evaluate potential environmental impacts associated with establishing additional a gun positions and munitions impact areas on U.S. Yuma Proving to support current and future Long Range Munitions (LRM) test activities. The EA was prepared in accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations implementing NEPA [40 Code of Federal Regulations (CFR) 1500-1508]; Department of Defense (DoD) Directive 4715.9, *Environmental Planning and Analysis* (1996); and *Environmental Analysis of Army Actions* (32 CFR Part 651; March 29, 2002).

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES: The purpose of the proposed action is to provide additional gun positions and impact areas on YPG that will accommodate the extended range and surface danger zones (SDZs) associated with LRM test activities. While the sites currently used for LRM can accommodate the distance to target and SDZs associated with some of the LRM platforms, the expanded SDZs associated with others are such that these sites do not provide the distance to target and or the SDZs do not fit within the boundaries of the installation. Therefore, the LRM program needs alternate sites to provide the test parameters and capabilities necessary to accomplish an expanded variety of test objective and test item configurations. Garrison considered a range of alternatives to accomplish the proposed action and the environmental analysis presented in the EA addressed one action alternative and the no action alternative.

Alternative A – LRM Gun Positions and Impact Areas in Cibola Region (Proposed Action) - YPG would establish 56 additional sites for gun positions and sites for 3 new munitions impact areas in the Cibola Region. Figure 2 in the EA depicts the general location for each of the proposed sites, locations of existing gun positions in the Cibola Region currently used for LRM testing sites, and the restricted airspace classifications in the project area. Table 1 of the EA provides a list of the sites proposed in the Cibola Region to accommodate the extended range of these munitions and a brief description of current conditions at each site.

Activities and projects addressed in this EA do not eliminate the need to submit a work order (DA 4283) or service order and other required documents, such as a dig permit for the proposed actions required for site development. Further, these actions may still require other environmental permit applications such as storm water permits, and state or federal regulatory agency approvals.

Permanent structures are not required for any of the proposed sites; however, the preparation and use of the sites to support test events involve a variety of activities and could involve the following.

Gun Positions

- Smooth and grade discrete portion of the sites to provide a level site for emplacement of weapon system, instrumentation, and vehicle parking.
- Lay down an Aggregate Base Course material to stabilize soil and control dust.
- Establish access roads where they do not already exist. Access currently exists to a majority of the gun position sites. However, 27 of the sites do not currently having established access roads in place. For these areas, personnel accessing the area will use existing two-track roads to minimize new disturbance. Where this is not possible, access roads may have to be constructed. Typically they would be constructed using a grader and would be constructed to a width of up to 20 feet. The area that would be disturbed will vary from 0.09 to 0.71 acres, depending on distance of the site from existing access. The project proponent will implement the following measures to minimize disturbance to soils, plants, and other resources of concern when locating and constructing any access new roads.
- Set up temporary/mobile facilities during test activities, including instrumentation and data acquisition vans, bomb shields/barriers, portable generators, and portable lavatories (port-a-potties).
- Delineate the designated footprint and access point by placing old telephone poles, railroad ties, or similar materials around the entire perimeter, as practicable.
- Set up mobile conditioning chambers at an adjacent gun position (500 to 1,000 meters) that is outside the SDZ.

Munitions Impact Areas

The following preparation and activities may occur at some or all of the impact areas depending on existing topographical and access conditions.

- Set up stationary or moving targets as needed on a test-by-test basis
- Limited leveling of discrete areas for placement of targets and instrumentation (clearing and leveling of the entire impact areas is not required
- Set up cameras and instrumentation
- Establish access roads, as needed

No Action Alternative - Under the no action alternative, YPG would not establish additional gun positions and impact areas to support LRM test activities. The no action alternative would severely limit YPG's ability to conduct LRM tests within established safety protocols and without adversely affecting surrounding land use.

SUMMARY OF ENVIRONMENTAL EFFECTS: The evaluation of affected resources and the potential for environmental consequences initially encompassed a broad range of Valued Environmental Components (VECs); however, the potential for environmental impacts to some of the resource areas were determined to be nonexistent, unlikely, or negligible. Chapter 3 of the EA provides a discussion of those VECs not carried forward for further detailed analysis. As a result, the scope of environmental analysis focused on the VECs listed below because they were determined to be potentially affected in connection with activities associated with the proposed action.

- Air Quality
- Biological Resources
- Cultural Resources
- Health and Safety
- Land Use, Recreation, and Airspace
- Soil Resources
- Transportation and Infrastructure
- Water Resources

The analysis found that no significant impacts to environmental resources would result from developing additional gun positions and impact areas at YPG to support the extended range and SDZs associated with the LRM program, as proposed under Alternative A (LRM Gun Positions and Impact Areas in Cibola Region).

The analyses in the EA included consideration of potential cumulative effects associated with of the proposed action that could occur on a regional scale, including those that could result from incremental impacts. The resulting data was used to evaluate potential direct, indirect, and cumulative impacts, and to plan for mitigation and monitoring as required.

The EA analysis included evaluation of several past, on going, and future projects in Cibola Region with potential to contribute cumulative effects on a regional scale (see section 3.11 of the EA). The analysis found that cumulative impacts to the natural and human environment on a regional scale are not likely to occur as a result of implementing the proposed action.

PUBLIC PARTICIPATION: Scoping letters were sent to Federal, State, tribal, and local agencies; and to public stakeholders on January 10, 2013. Comments received during the scoping process were considered and addressed in the EA, as appropriate. The U.S Army Garrison Yuma Proving Ground published a public notice in the Yuma Sun on February 24, 2013 announcing the availability of the EA and draft FNSI for review and comment. Copies of the EA and draft FNSI were sent to several stakeholders that requested copies during the scoping process were made available online (www.yuma.army.mil/mhub_documents.shtml). The public review period ended March 27, 2013 and comments received were addressed and incorporated into the EA, as appropriate.

CONCLUSION: Based on the analysis presented in the EA for establishing additional gun positions and impact areas on YPG no significant environmental impacts are anticipated as a result of implementing the project as proposed under Alternative A (LRM Gun Positions and Impact Areas in Cibola Region). Therefore, preparation of an Environmental Impact Statement is not required and a FNSI is the appropriate decision document to conclude the NEPA process.

I have read and concur with the findings and analyses documented in the Environmental Assessment and hereby approve the Finding of No Significant Impact.

13 MAY 13
REED F. YOUNG *Date*
COL, LG
Commanding

13 May 13
RICHARD T. MARTIN *Date*
Manager, Garrison